OSCILLATING SPINDLE SANDERS Get the lowdown on 8 models *Page 64*

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FEBRUARY 1999 ISSUE 112

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Pages 52–58

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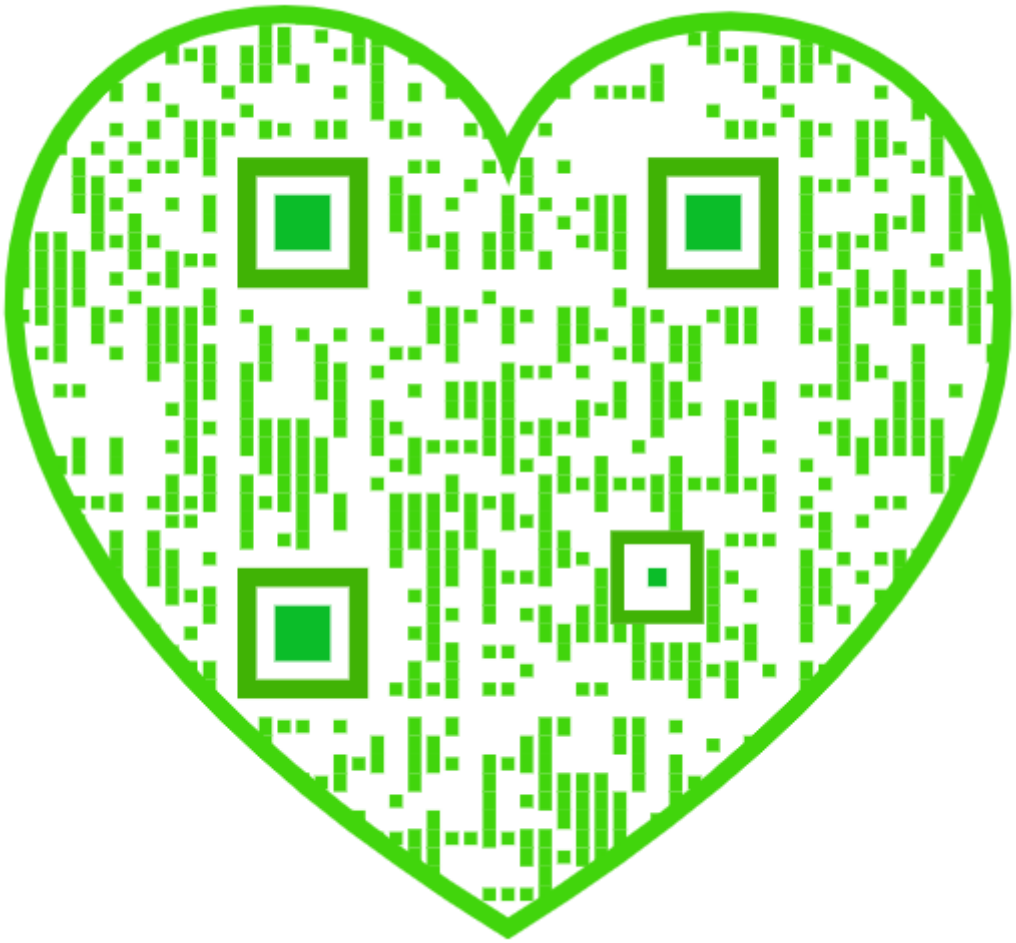

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ISSUE NO. 112 FEBRUARY 1999
This issue's cover wood grain: pine

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See how one Texan uses native wood to handcraft beautiful heirloom rockers.

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Add style and convenience to your kitchen with this two-person Shaker snack table.

81 Lathe artistry
Turner Ray Allen shows us how to construct and shape an impressive segmented bowl.

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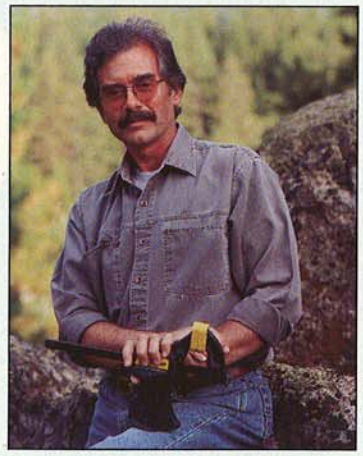

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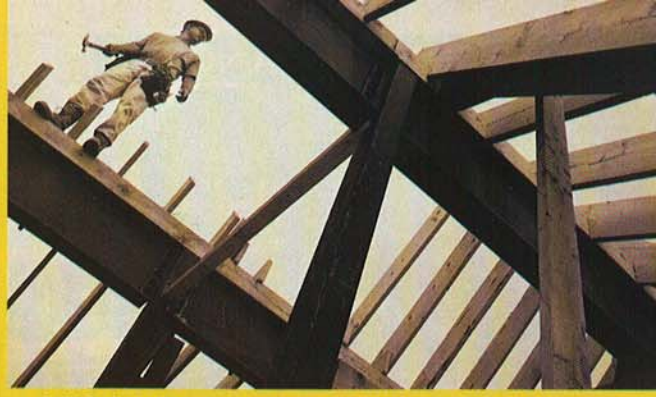

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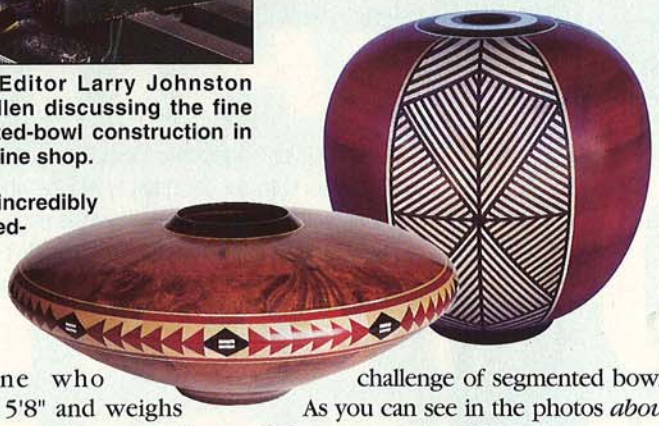
Ray Allen, a guy who can put his money where his mouth is

Special-Interest Editor Larry Johnston (right) and Ray Allen discussing the fine points of segmented-bowl construction in the *WOOD*® magazine shop.

How are these for incredibly beautiful segmented-bowl creations?



For someone who stands only 5'8" and weighs 180 pounds sopping wet, Ray Allen is an awfully confident kind of guy. And there's good reason why he's so sure of himself. For the last nine years, this 68-year-old retired heavy-construction worker has been perfecting his method of turning some of the most beautiful segmented bowls I've ever seen.

Recently, Ray spent some time here in Des Moines helping us develop the article that appears on *page 81*. At one point, I asked him if he ever had problems with the joints opening up after the turning was finished. True to form, he said, "Never! And if you can find a loose joint in any of the bowls I have here, I'll give you the bowl."

Segmented bowls aren't for those just turning for the first time, but they look so beautiful that they could very well inspire you to take up the hobby. Ray started out making bowls from solid-wood blanks, and after about a year and a half took on the challenge of segmented bowls. As you can see in the photos *above*, he's now a master of the art.

What makes for great-looking bowls? Ray says that it boils down to a couple of things. First, you need to select beautiful woods and arrange them in a pleasing fashion. And second, you must cut the segments, which are joined together to form multi-sided blanks, for a perfect fit. There's no room for sloppiness.

I can tell you one thing from personal experience. There are few things as satisfying in woodworking as putting the finishing touches on one of these beautiful creations. Why not give one a try?

Hot off the internet, the column, has arrived! Take a look at *page 10* for an assortment of interesting comments, answers, and ideas from our WOOD ONLINE discussion groups.

Larry Clayton

Photographs: Hetherington Photography; Ray Allen; Darrel Nish

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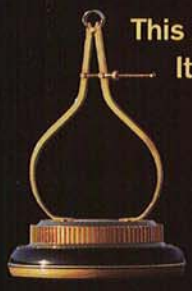

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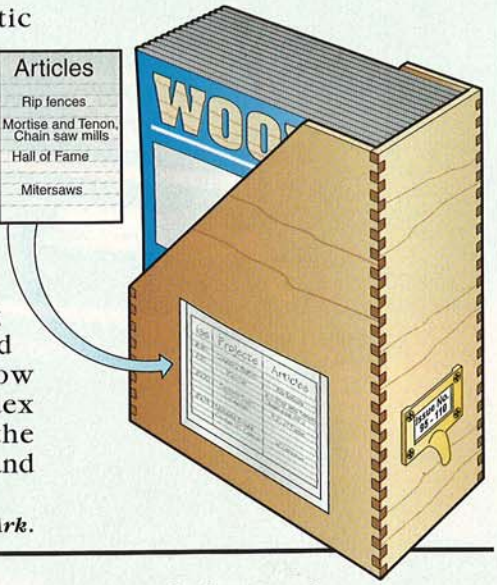
TALKING BACK

How to make our magazine file boxes even better

Issue #108 had some fantastic box-joint cases that are perfect for holding all of my past issues of *WOOD*® magazine. I added a detail that can help all of us to be a little more organized.

Iss.	Projects	Articles
#95	Country Buffet	Rip fences
#97	Planter	Mortise and Tenon, Chain saw mills
#100	Cyclone Dust Collector	Hall of Fame
#104	Molding Boxes Corner ET Center	Mitersaws



Glue a clear plastic pocket big enough to hold a 3×5" note card to the side of each case. Now write a customized quick-index on each card pertaining to the projects you intend to build and articles you'll refer back to.

—Ira Hill, Heber Springs, Ark.

Sometimes, it's better to sand than plane

In the March issue of *WOOD* magazine (#104), Rich Sturim noted that he destroyed a piece of prized curly maple by running it through his planer. I want to step in and help by sharing my success in this area.

When working highly figured wood, I use a 24" drum sander to do the job. I start with 40-grit, X-weight sanding belts, and then finish with my portable belt sander and finer grit paper. A wide belt sander would work for you in the same way.

If you don't have either of these machines, you can have the wood sanded by a lumber company or small furniture or cabinet shop. But I would recommend the investment. Sanding to thickness does take a bit longer than planing but the results, especially on figured wood, are well worth the extra effort.

—Roger Rusco, Ravenna, Mich.

Planely, our error

Thanks to all of you who wrote to us with the correction for the toy contest winners article in issue #108 of WOOD *magazine. George F. Campbell's third-prize winning aircraft is indeed a P-51 Mustang, not a P-40 as we noted. The Curtis P-40 was called a Warhawk.*

Speak your mind

We welcome your comments, criticisms, suggestions, and yes, even compliments. We'll publish letters of the greatest benefit to our readers. Write: Talking Back, *WOOD* Magazine, 1716 Locust St., GA310, Des Moines, IA 50309-3023

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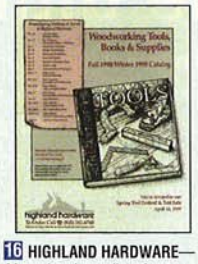

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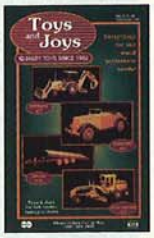

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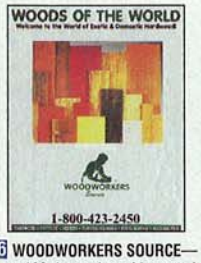

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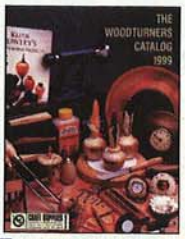

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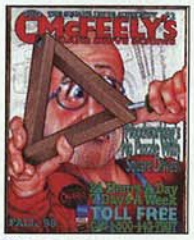

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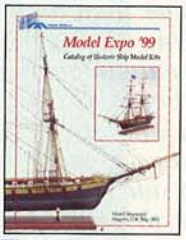

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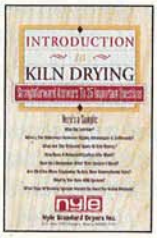

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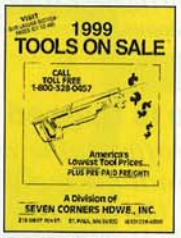
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WOODWORKERS TO THE RESCUE

Comments, answers, and ideas from our *WOOD ONLINE®* discussion groups

Note: If you would like more information on the woodworking-related subjects featured here, visit our *WOOD ONLINE®* discussion groups at www.woodmagazine.com

Note, too, that we have edited all entries in the interest of brevity and clarity while preserving the message. Opinions expressed here are those of our online participants.

GENERAL WOODWORKING

When tempertures rise, keep a cool shop

I'm having a new house built, along with a detached 22×26' wood shop. I live in Phoenix, Arizona, where it is pleasant in the winter but hotter than heck in the summer. I am considering cooling my shop with an evaporative cooler since they work well in our low humidity and are so economical (versus an air conditioner). However, they add moisture to the air. Would this have an adverse effect on wood stored in the shop? The cooler would only run while I'm in the shop working, and a large roll-up door would be open during this time.

—John Beilmann, Phoenix, Ariz.

● I would use an evaporative or swamp cooler in the non-humid months and then get an AC unit for the monsoon season. I'd also minimize running home appliances such as the electric range, dryer, and water heater during these times since they're all heavy power users. [The Phoenix power company also advises venting the hot air in the shop's ceiling.]

—Larry Medford, West Helena, Ark.

● This is just the set-up my dad has in Albuquerque. It works fine. Since the cooler must run with the windows open, and it must always use fresh outside air, the water does not build up. I don't know if he has ever measured the humidity in the house or shop, but it is still minimal. I was just there visiting and it still felt bone dry in the house.

— Rod Cole, Lexington, Mass.

My coffee table is bugged

I purchased a coffee table and recently have found some very small holes on the side of the table—some type of bug. You can see the little traces of wood powder. Can someone give me an idea of how I can get rid of these little critters?

—Dirley Moran (address unknown)

● I've had success in similiar situations by injecting a small amount of either Ortho Clor or Sevin into the holes. If you're careful you should kill the powder-post beetles [causing the problem] and not damage the wood or finish.

—D. White (address unknown)

● My business is the restoration of antiques and I see a lot of this. There are a number of exterminators in my area, and I pay a few dollars to have my piece added to a house that is being fumigated. It is fast, easy, and cheap, and it keeps me away from the stuff that is necessary to kill the little suckers. Another advantage is that it's a gas and does no harm to the piece.

—Jim Kull, San Ramon, Calif.

● Keep in mind that "them little suckers" lay eggs. Insecticide and gas will kill the critters but not the eggs. The eggs will hatch sometime in the future and you'll have critters again. One thing that will kill the eggs is heat, but that would only work for small pieces of wood and isn't practical for furniture. I would suggest two gas treatments. The first to kill the bugs. Then, wait until the eggs hatch and gas the offspring. It would be good to find out how long it takes the eggs to hatch so you don't do the second treatment too early or too late.

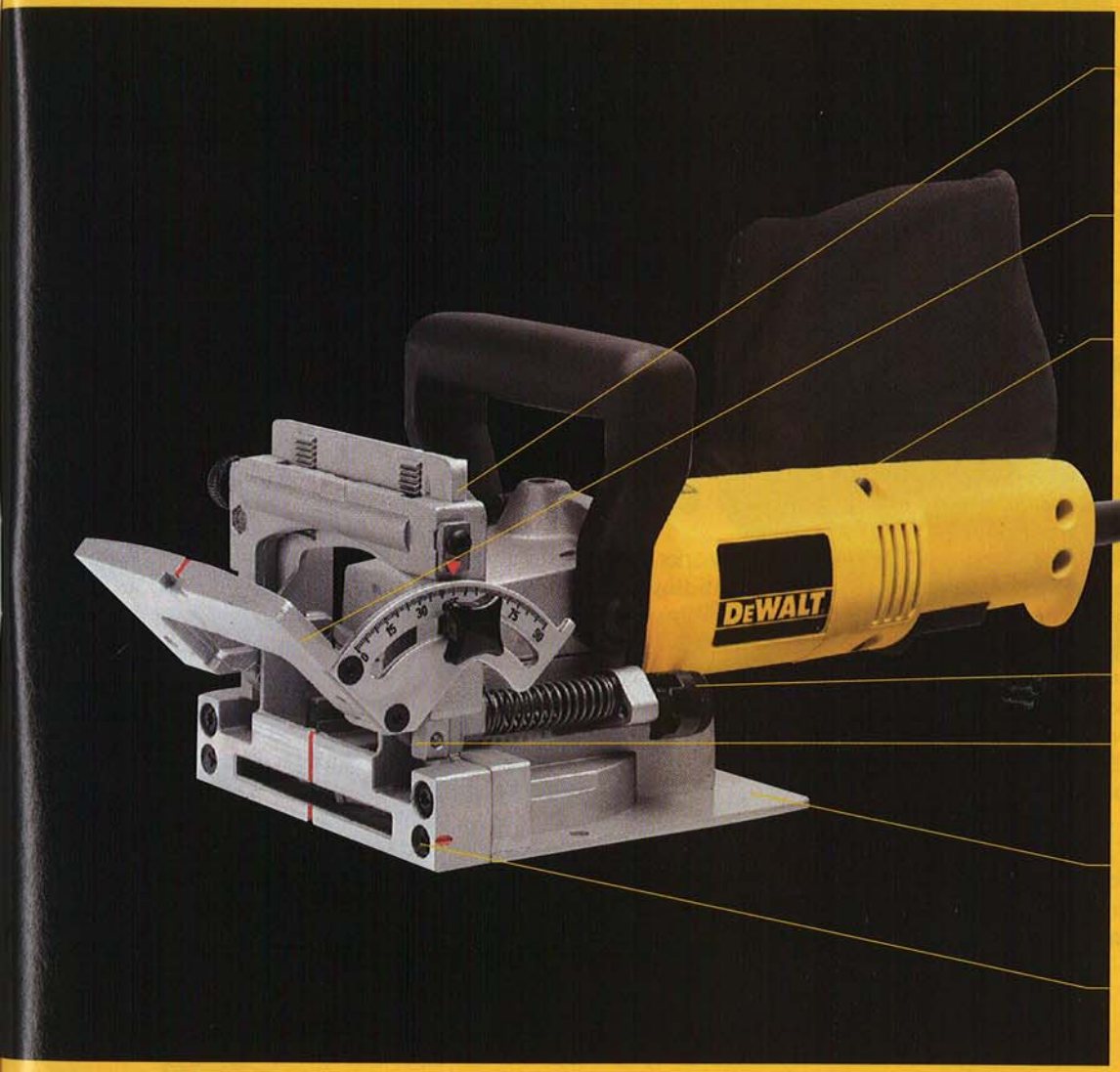
—Charlie Cadenhead, Dover, Minn.

● *Placing the furniture piece in a fumigation "tent" is excellent. However, if that's not possible, ask your neighborhood supermarket if they have a walk-in freezer and place the piece in there for a week. [The sudden shock of 0 degree temperatures can terminate bug infestation.]*

—Ron Willard, Boerme, Texas

Continued on page 12

THE BEST TOOL IN THE JOINT.



Dual rack-and-pinion fence ensures blade and fence are always parallel, for accurate joints every time

Integral, one-piece fence is adjustable and tilts from 0° to 90° requiring no extra parts

6.5 amp, 10,000 rpm motor provides power for the hardest woods

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Continued from page 10

TIPS, TRICKS, AND TRUE TALES

Clean hands at a small price

I have discovered a really cheap and effective product that cleans oil-based paint, oil, grease, etc., off hands. It's cooking oil—regular vegetable oil that is normally used for cooking. Use it just like the expensive hand cleaners. Then, use soap to wash the vegetable oil and whatever off your hands. It is as effective, and much kinder to your hands, and a heck of a lot cheaper than the fancy petroleum- or lanolin-based hand cleaners.

—Larry Graubner, Nolensville, Tenn.

● I discovered by accident that lamp oil—the kind you buy at Wal-mart for kerosene lamps—does the same thing. It happened when I couldn't find anything else to clean my hands after painting with oil-based stain and paint. It was in a handy-size bottle with a safety lid. I was surprised that it did such a great job, left my hands soft, and didn't remove my nail polish. You guys probably don't have that problem. It didn't smell very good, so I finished it off by washing with Dawn.

—Sandi (full name and address unknown)

● I use WD-40 for the same thing. It's already in the shop, and works great. It's like Brylcream—a little dab will do ya.

—Ray Dodge, Crossett, Ariz.

● The best and cheapest thing I have found to remove heavy dirt, grease, or paint is good old mineral oil. You just wipe it off with a rag or paper towel, and it is an old-fashioned laxative if you have another problem.

—Ken Oakley, St. Cloud, Fla.

Custom-made contour sanders

I built a picture frame for a mirror that my wife wanted to hang in our guest bedroom. I made the frame from red oak and used ogee and cove bits to create a decorative edge. As one would expect, the flat surfaces were easy to sand. To sand the concave surfaces, I selected short pieces of dowel with the same radius as the cove and ogee bits. By wrapping the dowel with sandpaper, I found I had a "custom-fit" sander for the curved surfaces. This works better than detail sanders and the price is right. I love how oak shines after using all the grits of sandpaper.

—Yukon (full name and address unknown)

● Yukon, I use dowels in much the same way except I mount the dowels to a small block of wood for a better grip.

—Jim Cook, Bristol, Tenn.

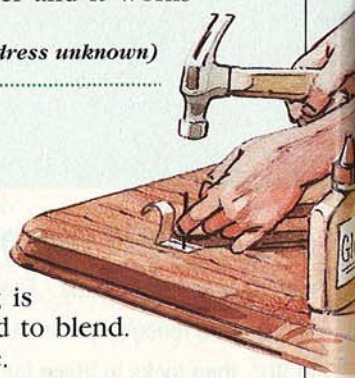
● The dowel idea works well. As an alternative, Lee Valley Tools Ltd. sells a set of contour sanding grips made of flexible rubber to be used as a backing for hand-sanding profiles. At $9.95 (U.S.) or $12.95 (Canadian) for a full set of 15, they're inexpensive and do the job. [Call Lee Valley Tools Ltd. at 800/871-8158.]

—Bob Sabourin (address unknown)

● Another neat trick is to place a piece of waxed paper over your contour and smash a glob of Bondo (available at automotive stores) into it. Then, either hold or spray-adhere your sandpaper onto the Bondo. In just a few minutes you have a true custom contour sander.

By the way, I have a Porter Cable profile sander and it works great. I wouldn't trade it for anything!

—Phil (full name and address unknown)



FINISHING & REFINISHING

How to keep cherry in cherry condition

I'm doing some trim work in solid cherry and will be finishing it with satin polyurethane. My question is when and what to use to hide the nail holes. I know the cherry will darken over time and want the "filler" to do the same thing.

—Ed S. (full name and address unknown)

● I use a chisel to peel up a thin shaving in the wood, then drive and set the nail. The shaving is glued back down over the nail and lightly sanded to blend. No need to worry about color change in the future.

—Tom Perry, Norfolk, Va.

● Cherry sawdust from the project mixed with a little glue may do the trick. After it dries, sand the nail holes flat to ensure you remove any glue off the project.

—Gordon Eyre, St. George, Utah

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Heavy-Duty 1/4 Sheet
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Heavy-Duty 5" Random Orbit Sander
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Heavy-Duty 5" Random Orbit Sander

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Paste wax

No-strip renewal for age-dulled finishes

You may not need to strip and refinish a piece of furniture just because it looks a little tired. Paste wax will give a deteriorated finish new life.

Age takes its toll on furniture finishes. Normal wear, oxidation, and light cause a finish, no matter how well cared for, to lose its luster as time tramples across it.

Faced with a dull and lifeless-looking finish on an otherwise sound piece of furniture, most of us are inclined to strip off the old finish and lay on a new one. But this approach is always messy and frequently a lot of work. And it could even prove costly. That's because removing the original finish might slash an antique's value. (If you suspect you do have a high-value item, consult a conservator or other antiques expert before you do anything to it.)

Paste wax brings new shine to the old finish on this étagère. Compare the luster on the top two shelves, which have been waxed and buffed, to the dull finish on the unwaxed ones below.

Leave that old finish on

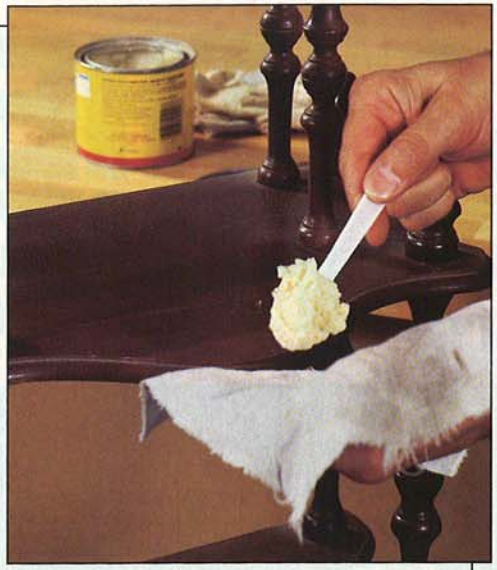
Instead of stripping an age-dulled finish, you can often restore its sheen simply by applying paste wax, according to wood-finishing wizard Bob Flexner. Paste wax fills finish-dulling scratches to restore the shine, as shown *below left*, while also protecting the finish against future wear.

Paste wax outperforms liquid furniture polishes in both regards by lasting longer. Wax stays on the job until it's washed off or worn away.

But don't expect paste wax to repair serious finish flaws, such as water marks or heat damage. Nor can it restore color where the finish has worn through. And wax won't shield the finish against heat, solvents, water, abuse, or the deterioration that occurs over time.

Here's how to revive an aged finish with wax

- Before applying paste wax, clean the finished surface. If it's really dirty, wash it with water and mild soap—something like Ivory or Murphy's Oil Soap.
- Wrap a golf ball-size lump of wax (you can use one labeled either as floor wax or furniture wax) in the middle of a 6" square of cotton cloth, as shown *above right*. Knead the wax until it's soft, then rub the wax-filled pad over the surface, covering a small area at a time. Doing this instead of dredging up a glob of wax on the outside of a cloth pad limits the amount applied. And because you're going to rub off the excess anyway, putting on less makes the next step easier.



To apply paste wax, wrap a ball of wax in a square of cotton cloth. Wax will ooze through the weave of the cloth.

- Watch for the waxed surface to turn dull, a sign that the solvents have evaporated. Just as it turns dull, wipe off the excess wax with a soft, clean cotton cloth. And do *remove* the excess; don't just smear it around. If you can make a finger streak on the surface, there's still excess wax on it.

  If you wait too long after the surface turns dull, you'll have to rub harder to remove the excess wax. So work in small sections.
- Polish with a lamb's-wool pad, used with a power buffer or electric drill. If you see smearing, you need to go back and rub more wax off with a clean cloth. Then, resume buffing with a clean pad.
- A second coat of wax will fill any tiny crevices in the first coat, often resulting in an even more dramatic improvement.

Keep that surface shining

To maintain the shine, don't apply liquid furniture polish over a paste-waxed surface. The solvent in the polish will dissolve the wax, causing smearing. Instead, dust with a feather duster or soft cloth. (Dampen the cloth slightly with water to help pick up dust.)

Buff the surface with a soft, dry cloth if it turns dull. For more shine, you can wax the surface again. Properly applied, rubbed, and buffed, paste wax will last a long time and won't build up on the furniture.

Photographs: Marty Baldwin

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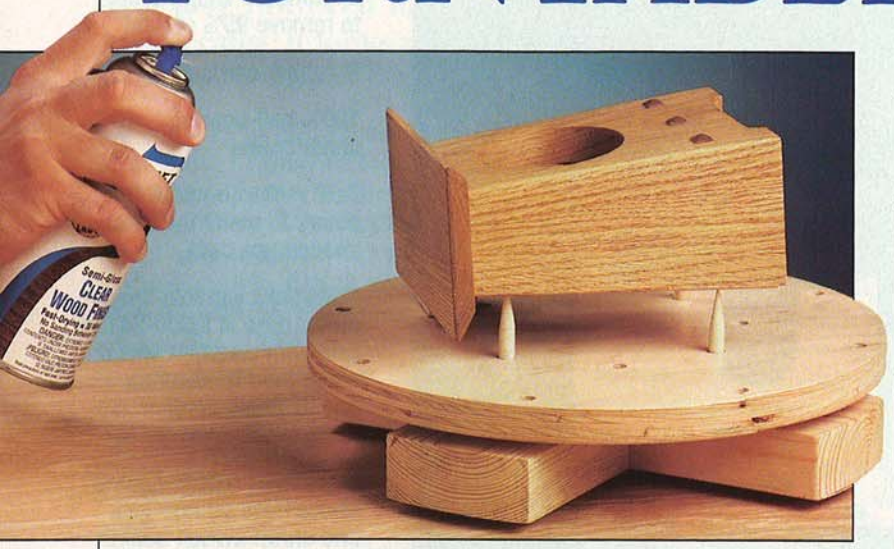
'Round And 'Round She Goes

FINISHING TURNTABLE



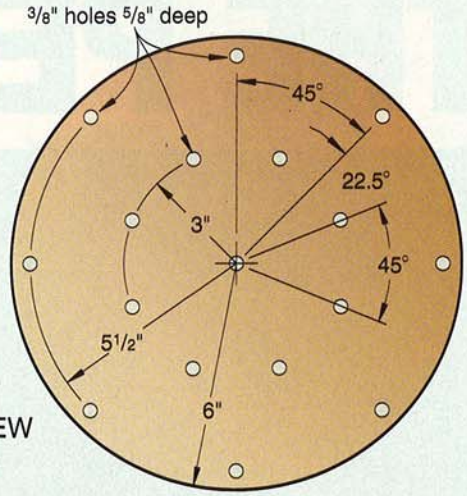
Unless you can walk completely around your workbench, you're limited to finishing only two, maybe three, sides of your projects without lifting them. With this versatile finishing turntable designed by *WOOD*® magazine reader Mike Sarnes, you can apply finish to every surface without taking a step or lifting the project.

To use the jig, space three or four sharpened dowels where they'll best support your workpiece. (You may need to sand the base of the dowels slightly to fit the holes.) Finish the back or bottom, then place the piece finished side down on the dowels—the points make minimal contact with the fresh finish. Finish the remaining surfaces by rotating the turntable while you spray. Hold smaller parts with clothespins glued to dowels as shown *above.*

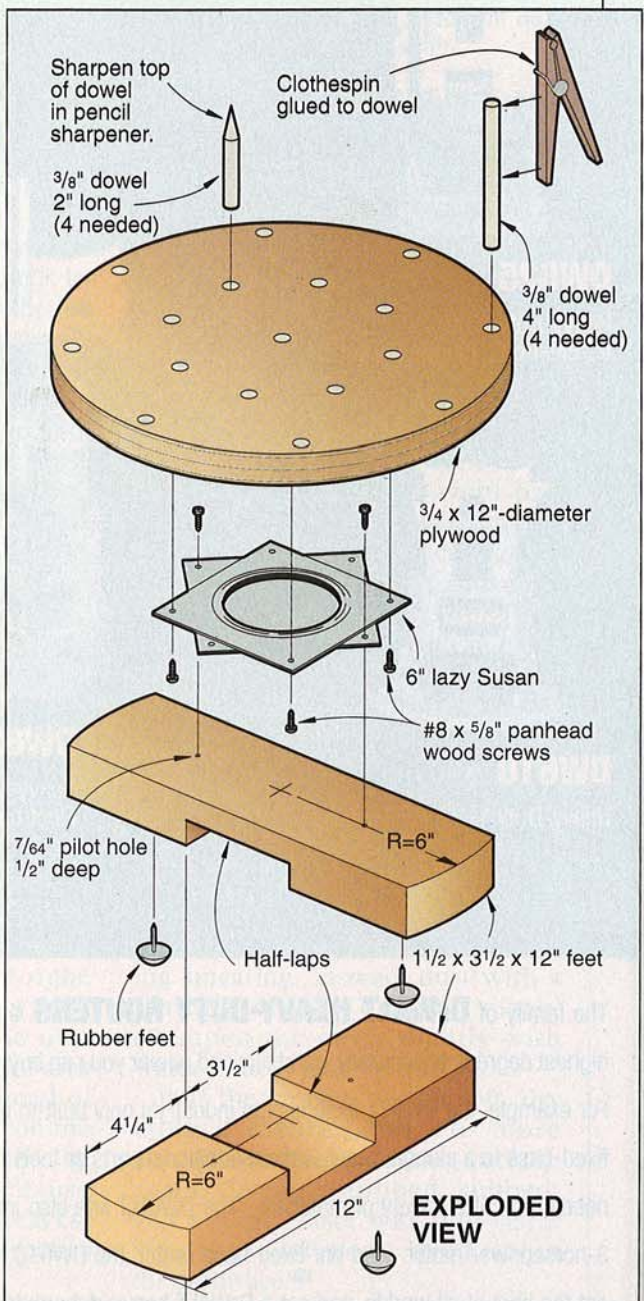
Buying Guide

6" lazy Susan. Available from woodworking hardware catalogs, including Woodworker's Supply, 800/645-9292, and Woodcraft, 800/225-1153.

Project Design: Mike Sarnes, Fairview, Mich.
Illustration: Kim Downing
Photographs: Baldwin Photography



TOP VIEW DETAIL



Don't Buy a Big Tiller

For a Small Job!

If your garden is an acre or more, you may want to buy a big tiller. If it's any less, you should buy a Mantis Tiller/Cultivator. Big tillers till and weed 20" or more wide. The Mantis Tiller/Cultivator tills and weeds a practical 6" or 9" wide.

Big tillers weigh almost 300 lbs. The Mantis tiller weighs just 20 lbs.! Simply turning a 300 lb. tiller in a backyard garden without running over crops (or yourself) is a challenge.

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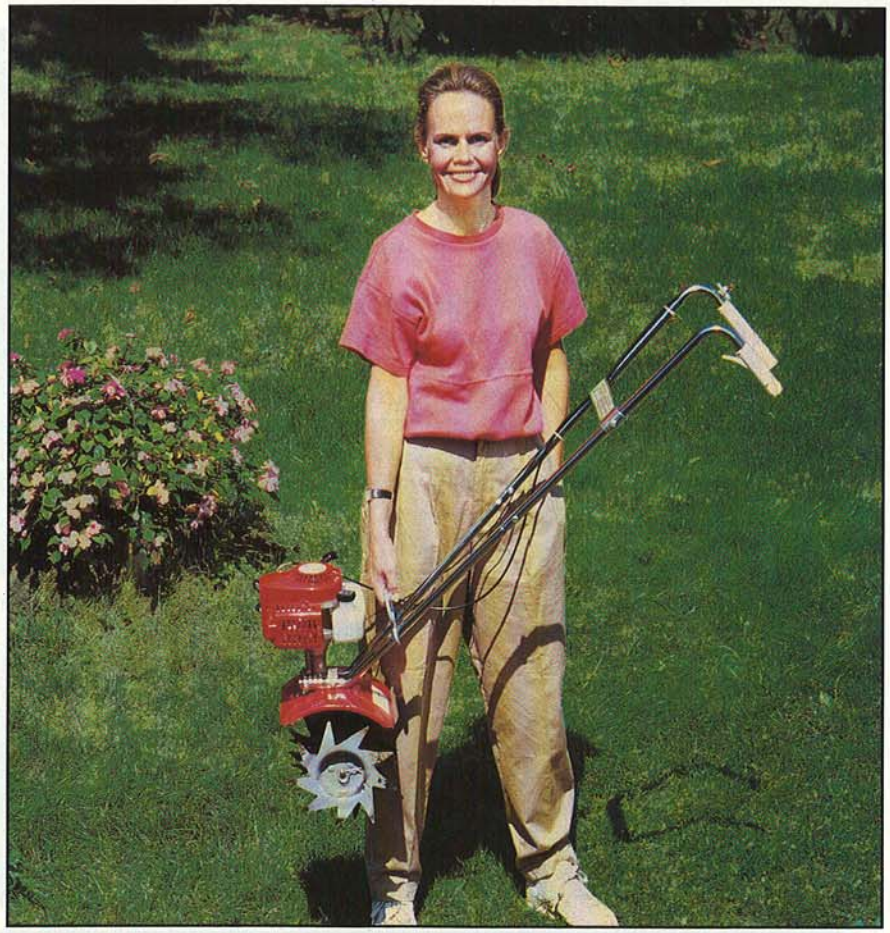
Most big tillers were designed to just till (but many now offer clumsy "add-on" attachments to try to justify their high cost). The Mantis Tiller/Cultivator was designed from the beginning to precisely match a small, powerful engine to a variety of useful attachments for your yard and garden. Tiller. Cultivator. Furrower. Edger. Lawn Aerator. Lawn Dethatcher. Hedge Trimmer.

Most big tillers cost an arm and a leg. Despite the fact that the Mantis is a tough, durable, precision instrument...it costs a *fraction* of what you'll pay for a big tiller.

Look at the warranty.

Most machines are *partially* covered for 90 days to a year. The Mantis Tiller/Cultivator's patented tines are guaranteed *forever against breakage.* If they ever break, return the broken one to us for a replacement. The *tiller is guaranteed for two years, from the date of purchase, against defects in materials or workmanship.*



If we didn't make such a fine machine we couldn't make such a fine offer.

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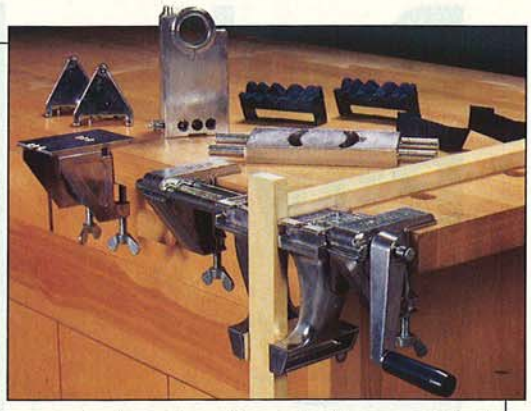
One vise does the work of many



Whenever I see a tool that claims to do a lot of different jobs, I'm skeptical; usually, it doesn't do any of those jobs very well. That's why I was pleasantly surprised by the Zyliss Portable Vise. This aluminum-alloy vise claims to be everything from a conventional bench vise to a drill press (with the optional accessory package).

The large main jaws have a parallel set of smaller jaws connected to them. The faces of both sets of jaws are on the same plane, so you can clamp two boards of the same width together at a right angle, with one turn of the crank. This setup works just as well for clamping at angles other than right angles.

The moveable jaw on the Zyliss Portable Vise positions quickly, thanks to a half-nut quick-release mechanism, and the 8½" opening was big enough to handle any job I could come up with. The crank-style handle easily moves out of the way of your work, and makes tightening the jaws effortless.

Since it's lightweight and removable, you can bring the vise to the work instead of the other way around. For example, I needed to plane a slight bevel on a door. Standard clamps wouldn't do it, and sawhorses alone were awkward. But, by clamping the Zyliss Portable Vise to a sawhorse, and the door in the vise, I handled the job easily. And the removable soft jaws kept me from damaging the door's finish.

Using the end stop, I could clamp virtually any length workpiece (up to the length of my bench) with more than enough pressure. I only found one limitation: I couldn't clamp the vise or end stop to any surface more than 2½" thick.

Most of the pieces in the optional accessory kit (some shown in the photo *above*) probably wouldn't see much use in my shop, and would probably end up lost when I did need them. Unless you think you'll use them a lot, stick with the basic set and you'll be happy.

—Tested by Dave Henderson

PRODUCT SCORECARD

Zyliss Portable Vise

Performance	★ ★ ★ ★ ☆
Price	About $233 ppd. (with accessory package, about $328)
Value	★ ★ ★ ½ ☆

Advanced Machinery Imports, LTD., P.O. Box 312, New Castle, DE, 19720. Call 800/220-4264 or visit www.advmachinery.com

Precise, pricey gauge promises, delivers accurate tool setups

When it comes to setting up woodworking machines, you won't find any gauge more precise than the MasterGage. In fact, unless you're a precision machinist you probably never have used a setup tool as precise, accurate, and versatile as the MasterGage.

At first glance, the MasterGage, machined from aircraft-quality aluminum, has a no-nonsense air about it, with its black anodized finish and white-filled engraved scales. Sliding the height-indicator arm through its 3" range and swinging the red-anodized angle gauge to its 45° limit confirms that first impression. There's no sloppiness, no roughness. Nothing about this thing says "just about" or "close enough."

The hardened measuring arm indicates height or depth in fractional inch, decimal inch, and millimeter scales. You can easily adjust it to .02" (2/100") accuracy, and can probably hit .01" (1/100") reasonably well, if you should really need to. Handy for such tasks as setting tablesaw blade height or cutting depth for a router bit, the arm slides smoothly on two stainless steel rods.

Protractor scales read from 90 to 45° and 0 to 45° in ½° increments. The red-line plastic cursor lets you adjust the protractor with ¼° accuracy. No other tool allows you to set blade angles on tablesaws, radial-arm saws, or compound miter-saws so easily or accurately.

Several available accessories, including a dial indicator, a miter-gauge slot bar, and a level help extend the MasterGage's capabilities. Available magnet assemblies will hold the unit firmly in place on steel and iron tool tables.

For the average woodworker, the MasterGage's principal drawback is its price. At $225 plus shipping and handling, the device falls solidly into the Workshop Luxury category for most hobbyists. And a MasterGage with all the accessories will set you back more than $600. But anyone who demands precision at any price will want to take a close look at the MasterGage.

–Tested by Bob McFarlin

PRODUCT SCORECARD

MasterGage

Performance	★ ★ ★ ★ ★
Price	$225 plus $9.00 shipping and handling
Value	★ ★ ★ ☆ ☆

Production Solutions, P.O. Box 3072, Thousand Oaks, CA 91359-0072. Call 805/492-4616 or visit www.mastergage.com.

Continued on page 22

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*Based on MSRP comparison of Chevrolet and Ford base models.

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Regarding our patent-pending cutterhead snipe control lock that stabilizes the cutterhead during operation: "Compared to the other machines in the test, the Delta produced the cleanest surface and the least amount of snipe. The other planers in the test also gave us excellent surface finishing, but the Delta stood out as just a bit better."

Woodworker's Journal, January/February 1998

Regarding our quick-change 2-knife system with two high-speed steel, double-edged, reversible knives: "... quick-change knives that we found easy and accurate to install. We found that with the quick-change systems we aligned the knives within .001." And, we could install both knives in about five minutes." "Editors' Choice Top Tool™ "

Better Homes & Gardens® Wood,® November 1996

Regarding the fact that you can take precision with you, wherever you go: "The Delta got great marks for quality of cut and portability, and for its innovative cutterhead assembly lock." "Editors' Choice"

American Woodworker,™ December 1996

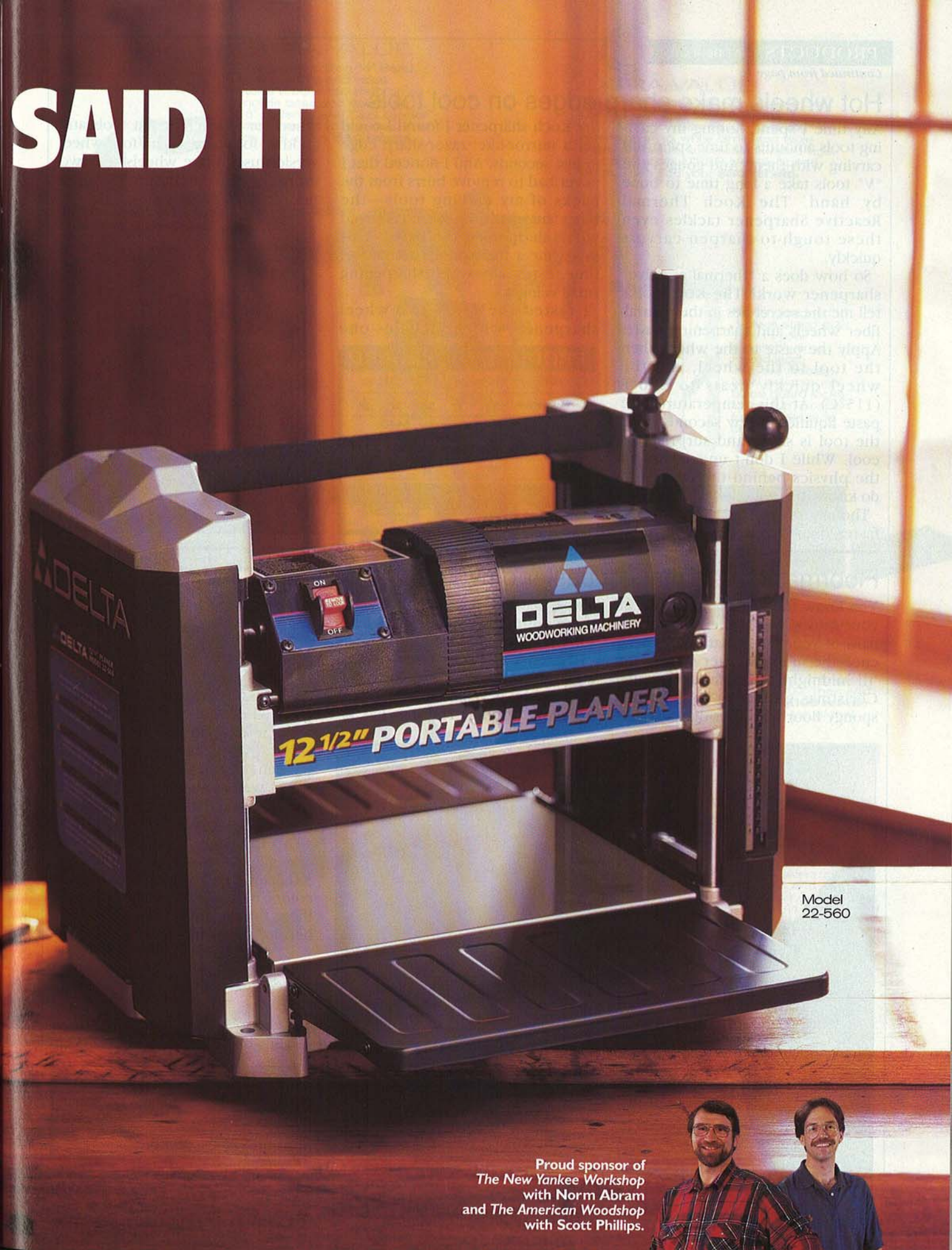
THE POWER OF THE PROS

DELTA
WOODWORKING MACHINERY
A Pentair Company

All of which leaves us with very little to say except this: If our planer fails to perform up to your expectations within 30 days of purchase, you can return it for a full refund. That's our Superior Performance Guarantee. And now, for a limited time, we'll even throw in an extra set of knives – a $30 value. Call toll free for the name of your nearest Delta dealer. Delta International Machinery Corp., 800-438-2486. In Canada, 519-836-2840.

www.deltawoodworking.com

SAID IT



Model
22-560

Proud sponsor of
The New Yankee Workshop
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and *The American Woodshop*
with Scott Phillips.

Continued from page 18

Hot wheels make sharp edges on cool tools

Any time I spend honing my carving tools amounts to time spent *not* carving with them. And gouges and "V" tools take a long time to hone by hand. The Koch Thermal Reactive Sharpener tackles even these tough-to-sharpen carvers quickly.

So how does a "thermal reactive" sharpener work? The Koch folks tell me the secret lies in the natural-fiber wheels and sharpening paste. Apply the paste to the wheel, then the tool to the wheel, and the wheel quickly heats to 240°F (115°C). At this temperature, the paste liquifies. A few seconds later, the tool is sharp and surprisingly cool. While I don't understand all the physics behind the process, I do know that it works.

Though any electric wheel works faster than honing by hand, with the Koch sharpener I found I could get a mirror-like, razor-sharp edge in just seconds. And I noticed that I never had to remove burrs from the backs of my carving tools—the burrs automatically were removed when sharpening the bevel. This saved me a tremendous amount of time, especially when sharpening small veiners.

I tested the Koch two-wheel sharpener, which includes one wheel for sharpening flat tools and another for gouges. The four-wheel version uses those wheels and two more for extremely fine grinding prior to sharpening.

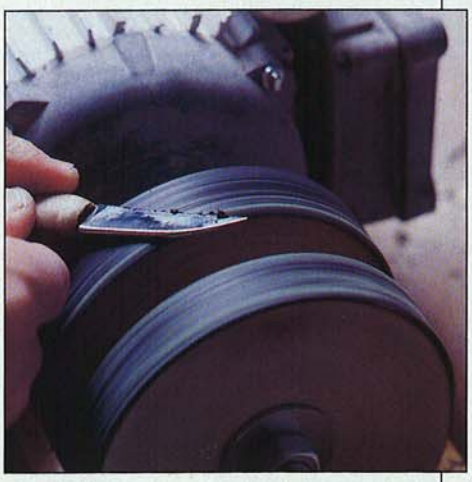
—Tested by Harley Refsal, WOOD® magazine carving consultant

PRODUCT SCORECARD

Koch Thermal Reactive Sharpener

Performance	★ ★ ★ ★ ★
Price	2-wheel sharpener, $440; 4-wheel sharpener, $538 ppd.; sharpening paste, $22
Value	★ ★ ★ ★ ☆

Koch Germany, 160 Hurley Ave., Kingston, NY 12401. Call 914/339-2783.



Floormat's "feet" make it easier on yours

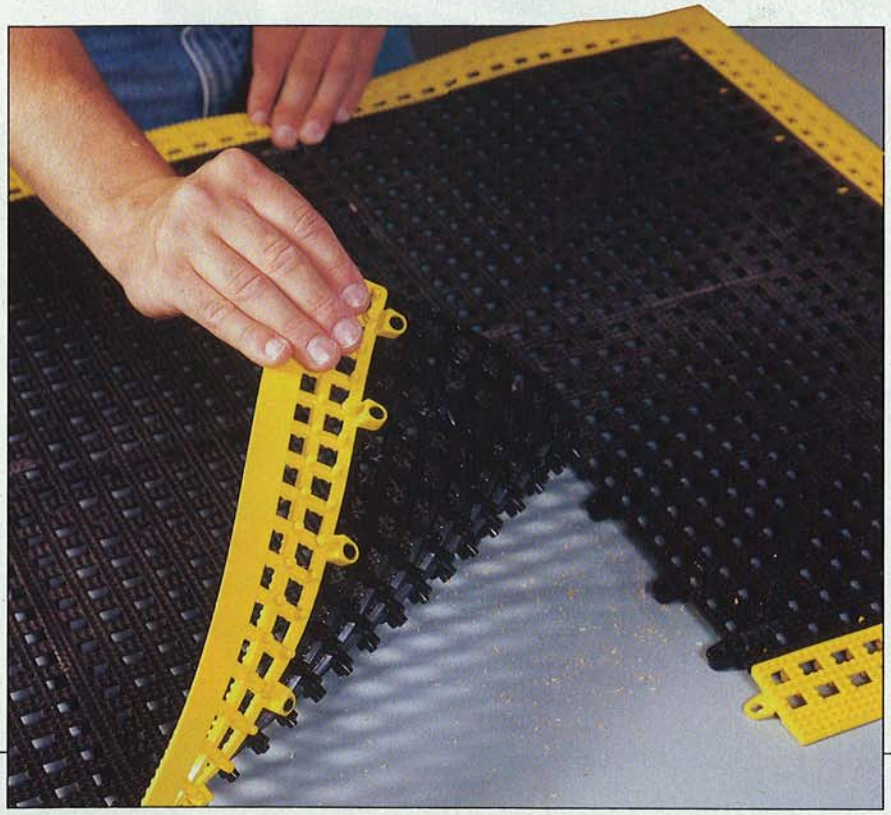
You know the feeling—the ache in your knees, the tenderness in the balls of your feet—that you experience the morning after staying up 'til midnight to finish last-minute Christmas gifts. You've tried the spongy floor mats, but the dust and chips that invariably collect make them slippery. Dri-Dek floormats solve both problems.

I tested a 2×4' mat consisting of eight 12" interlocking squares, surrounded by beveled edge pieces to prevent tripping. The mat has ¾" square holes in it that allow dust and small chips to drop through to the floor where they don't create a hazard. At the end of the day, just vacuum the debris back up through the holes.

Instead of spongy material to provide the cushion, the Dri-Dek mats use 5/16" "feet" under the gridwork. Though the mat I tested didn't cushion as well as some other mats I've used, I found that it stayed put even when I applied pressure to my work.

The 12" Dri-Dek squares also are available individually, in 3×4' sheets, 3×12' rolls, and eight mix-and-match colors. When purchasing in any of these forms, you'll need to buy the beveled edges and corners.

—Tested by Randy Zimmerman



PRODUCT SCORECARD

Dri-Dek floormat

Performance	★ ★ ★ ★ ☆
Price	TwoxFour Workstation Mat, $52.60 plus shipping
Value	★ ★ ★ ★ ☆

Dri-Dek Corp., 2706 South Horseshoe Dr., Naples, FL, 34104. Call 800/348-2398, e-mail dri-dek@msn.com, or visit www.dri-dek.com.

Continued on page 24

EXTRA VALUE

The Grand Edition 14" Band Saw is one grand value. Rides around the shop on a mobile base and sports an 18" rip fence and Cool Blocks™. More than $225 in extras. Then top it off with a **$50 rebate.**

Model 28-270

EXTRA VALUE

The Grand Edition 10" Contractor's Saw.* Loaded with over $200 in extras. A 30" Unifence Saw Guide, cast iron extension wing, white laminated table board and white adjustable support legs, plus a 50-tooth ATB&R carbide-tipped blade. Then add your **$50 rebate.**

Model 36-455

Newly designed, 3-piece stand cuts 70% of your assembly time. Flared legs improve stability. New see-through blade guard locks in the "up" position to facilitate blade changes.

White Hot.

EXTRA VALUE

Grand Edition Unisaw extras add up to over $300. Then add a **$100 rebate** on top of that.

Each Grand Edition Unisaw* carries the personalized name plate of its owner. Namely you.

Model 36-920

We've added an extra cast iron extension wing to start with. Then a 52" Unifence* Saw Guide, white laminated table and shelf board, white adjustable steel support legs and a 50-tooth ATB&R carbide-tipped blade.

Unisaw* stands alone for quality and precision. Every single arbor is flange-faced after assembly to reduce run-out. An extra step that other manufacturers don't bother with.

The Grand Edition series from Delta. Each a Delta classic. Each done in white. And each made in the USA and loaded with extra goodies. These babies are hot. And they'll be built in limited quantities, for a limited time only. (Extra values and rebates in effect through March 31, 1999.) For the name of your nearest participating dealer call Delta International Machinery Corp., 800-438-2486. In Canada, call 519-836-2840. Rebates are available in Canada (in Canadian funds) on these models only.

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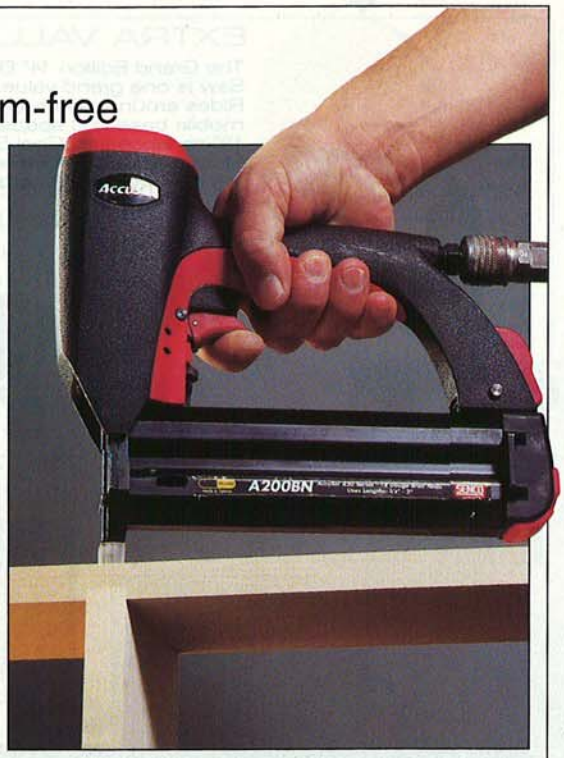
www.deltawoodworking.com

Continued from page 22

Low-cost pneumatic nailer works virtually jam-free

Homebuilders and production shops have long enjoyed the benefits of air-powered nailers. But only in recent years have pneumatic brad nailers become truly affordable for the home woodworker. Senco, one of the most prominent names in professional air tools, has joined the battle of low-cost nailers with its line of AccuSet brad nailers and finish staplers.

These well-balanced tools felt comfortable in my hand and have some nice features. Unlike other air tools that hit you in the face with a blast of exhaust, the AccuSet's exhaust exits harmlessly from the rear of the machine. A thumbwheel just below the trigger allows you to adjust the countersink depth of the fastener, from just-above-flush to buried. Another nice touch: The tools come in hard plastic cases complete with safety glasses, lubricant, wrenches, and a box of fasteners.



In testing, I found these AccuSet tools nearly impossible to jam. Even when I fired 2" brads directly into a steel plate, the fastener just crumpled into a ball and fell away from the plastic safety tip. The nailer was ready to fire again immediately without so much as opening the magazine.

The A200BN Brad Nailer I tested uses 18-gauge brads from ⅝" to 2" in length. The A150LS Finish Stapler drives ¼" crown staples ½" to 1½" long. The AccuSet line also includes the A100LS Finish Stapler (which accepts staples ½" to 1" long) and the A125BN Brad Nailer (which drives brads ⅝" to 1¼" long).

—Tested by Bob McFarlin

PRODUCT SCORECARD

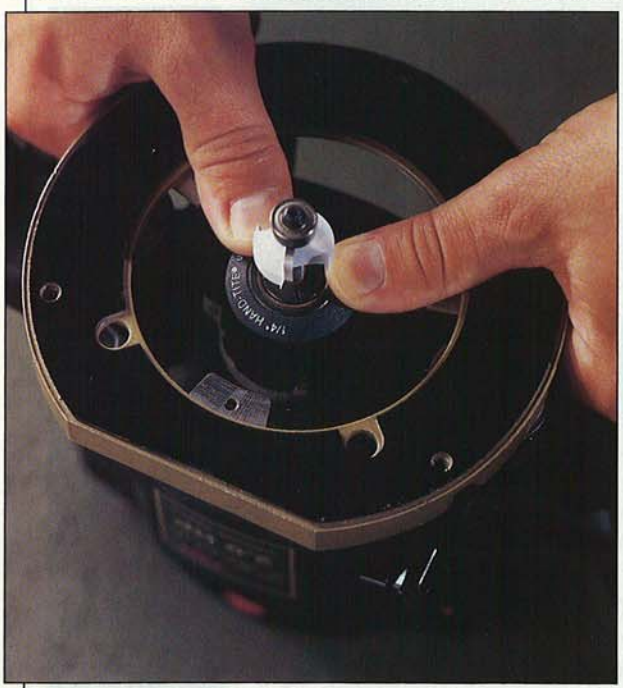
AccuSet pneumatic nailers & staplers

Performance	★ ★ ★ ★ ★
Price	A200BN 2" brad nailer, $139; A125BN 1¼" brad nailer, $99; A150LS 1½" finish stapler, 149; A100LS 1" finish stapler, $109
Value	★ ★ ★ ★ ☆

Senco, 8485 Broadwell Rd., Cincinnati, OH, 45244. Call 888/222-8144.

Change bits in a snap with this Skil router

With many drills and jigsaws, you can change bits and blades without tools. Today, believe it or not, you can swap router bits without wrenches. Skil's 1845-02 Classic Plunge Router features a Jacobs ¼" quick-release collet that makes wrench-hunting and knuckle-banging a mere memory.



To change bits, simply snap the collet's outer sleeve up, insert the bit, and snap the sleeve back down, as shown in the photo *left*. It takes some effort to close the collet, and my fingertips came close to the bit's sharp cutting surface before I could get enough pressure to do the job.

Going into the test, my main concern centered on bit slippage: Could a wrenchless collet really hold bits fast? The Skil 1845-02 exceeded my expectations. Only when heavily force-feeding a ½" full-profile roundover bit into white oak did I detect any slippage.

Collet aside, the Skil 1845-02 has some other nice features as well. Its soft-start, variable-speed, 10-ampere motor impressed me by instantly compensating for load changes. Plastic bellows protect both plunge posts from pesky dust. And I found the plunge-lock lever well-placed by my left index finger, but I had to push it beyond the comfortable reach of my finger to lock in the plunge depth.

—Tested by Dave Henderson

PRODUCT SCORECARD

Skil 1845-02 Classic Plunge Router

Performance	★ ★ ★ ★ ☆
Price	$125
Value	★ ★ ★ ★ ☆

S-B Power Tool Co., 4300 West Peterson Ave., Chicago, IL 60646. Call 773/286-7330.

$50 REBATE
Any Delta 14" Bandsaw—open or closed base. This one's a Delta classic.

$50 REBATE
Delta Sanding Center® Belt/Disc Sander. (Model 31-280)

$100 REBATE
This one will handle just about anything you've got to joint. The Delta DJ-30 12" Jointer (Models 37-360/1) stands ready to take on a whole tree if you've got one.

$100 REBATE
(Model 37-350 with electricals) DJ-20 8" Jointer. A mass of cast iron and precision.

$200 REBATE
Put more productivity and large capacity planing into your shop with the Delta DC-580 20" Planer (Models 22-450/1). Delta will put a couple hundred bucks back into your pocket.

$50 REBATE
DC-380 15" Planer with stand and extension wings. (Models 22-675Y/6Y)

$50 REBATE
Any of our 2000 Series 10" Contractor's Saws® with Premium Fence. (10" Contractor's Saw® II is not part of this rebate offer.)

The Great Rebate.

$100 REBATE
Any model Unisaw®—right or left tilt—Biesemeyer or Unifence.® You spec your dream saw. We'll put a hundred bucks back in your pocket.

Maybe the greatest rebate offer we've ever made. Delta workhorses, every one. The Delta stuff you really wish you had. With a little extra incentive to push you over the edge. A check in the mail from Delta, for a limited time, that is. (Through March 31, 1999.) So pick up the phone and call for the name of your nearest participating Delta dealer. Delta International Machinery Corp., 800-438-2486.

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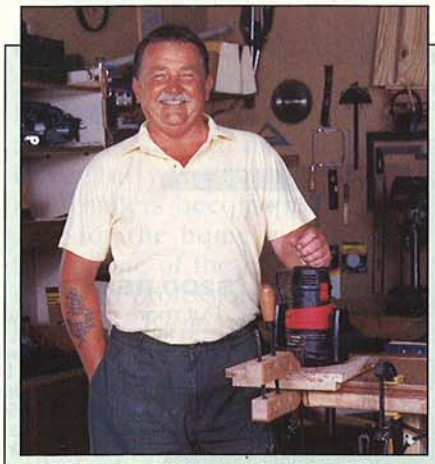


***WOOD*® magazine reader Don Thomas takes a break from routing keyhole slots with his prize-winning jig.**

After a hard day at the foundry, Don Thomas softens his material of choice and works wood. Don "finally turned serious" about woodworking eight years ago. Around that same time, his garage became a full-fledged workshop.

In that shop, Don has crafted many projects, including curio cabinets and wood-framed mirrors. The frustration he encountered aligning keyhole slots in the frames led him to build the slot-cutting jig at *right*. We liked Don's jig so much we proclaimed him our Top Shop Tip winner.

Have you solved a problem in your shop? Share the solution with us. If we publish it, we'll pay you $40 for your trouble. And if we select your tip as our Top Shop Tip, you'll get a tool prize valued at more than $250. To submit a tip, send a letter with your daytime phone number, and a photo or drawing of your idea, to:

Tips from Your Shop (And Ours)
***WOOD* Magazine**
1716 Locust St., GA310
Des Moines, IA 50309-3023

We try to publish original shop tips, so please send your ideas only to *WOOD* magazine. And remember, we cannot return submissions. Thanks!

Dave Campbell

GENERAL-INTEREST EDITOR

With this jig, matched keyhole slots are a lock

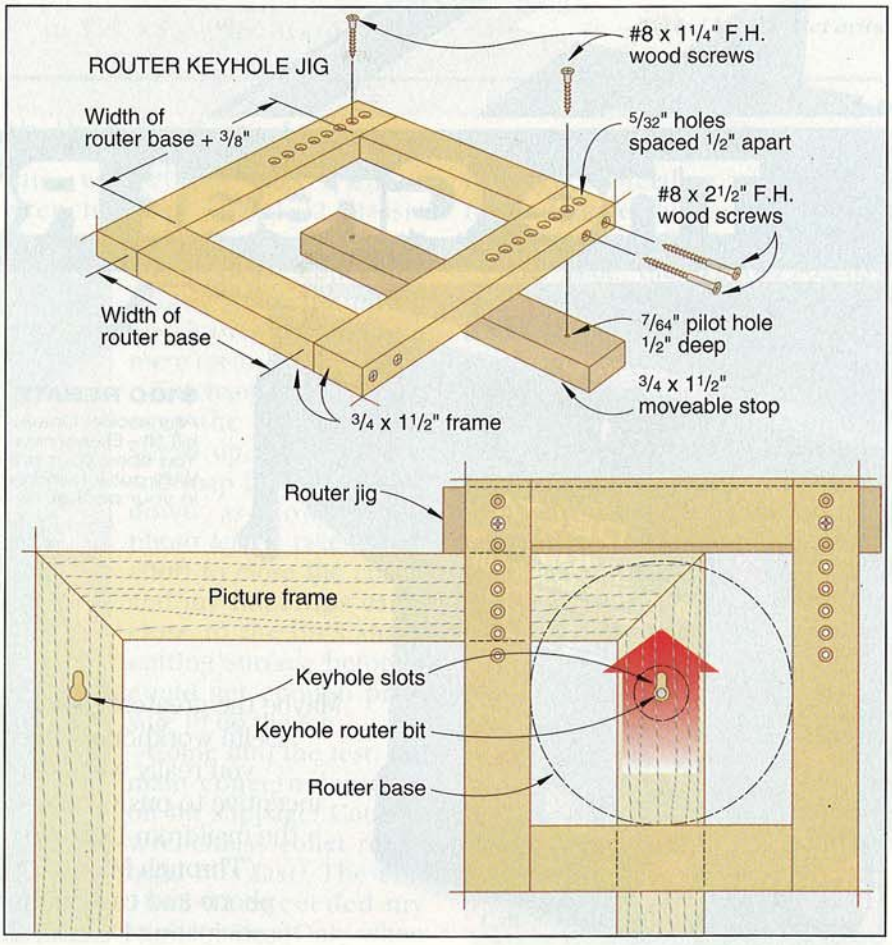
Aligning two keyhole slots on a mirror frame or shelf used to frustrate me. If the holes weren't the same distance from the top of the frame, I found myself offsetting the wall hangers to compensate for the crooked keyholes.

To make the cuts consistent, I fashioned the jig shown *below* from ¾" stock. The moveable stop allows me to bore slots as far as 8" from the top of the frame. Once the stop is set, I simply center the jig on one of the vertical frame pieces and clamp it in place. With my plunge router (with keyhole bit) in the near end of the jig, I plunge, slide my router along the jig until it contacts the far end, then back out of the cut. I then clamp the jig to the other vertical frame piece without moving the stop, and repeat the process.

— Don Thomas, Augres, Mich.

TOP SHOP TIP

Top Shop Tip winner Don Thomas can go cordless now that he has a DeWalt 12-volt drill/trim saw combo kit. Enjoy it, Don!



Continued on page 28

ANY TOUGHER AND IT WOULD HAVE A GUN TURRET AND BE ON MANEUVERS.

Arm yourself with the RIDGID® 10" Compound Miter Saw. Led by 3 horses* and 15 amps of Emerson motor, a giant size output gear/bearing assembly and

reinforced by durable die cast construction, it's so tough we back it with a lifetime warranty against material and manufacturing defects.

Ah, but it has more than just brawn. Like our exclusive Repeat-A-Cut™ fence to save time and aggravation on multiple same length cuts. Or the patented Bevel Stop Bypass, to ease set-ups when corners and walls aren't perfect 45°s and 90°s (aren't they all!). And the high visibility miter/bevel indicators and Sof-Touch™ handles to help you zero in precisely and comfortably on your workpiece target.

Make sure the RIDGID Miter Saw is in your arsenal. Anything less will leave you, well, unprotected.

RIDGID

For more information call 1-800-4-RIDGID,
visit our website @ www.ridgidwoodworking.com or your nearest Home Depot store.
*Max. developed horsepower.

Continued from page 26

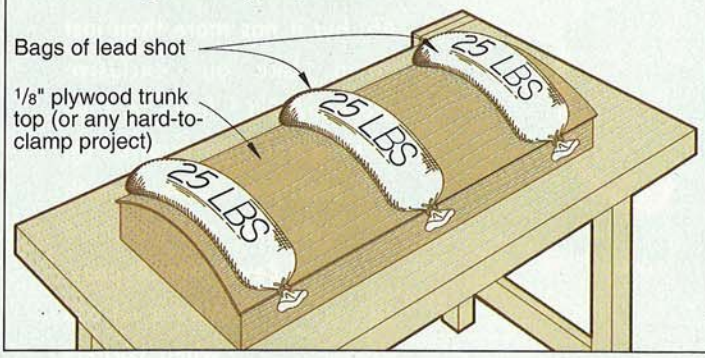
"Bag-o-lead" clamping system holds odd shapes

I've seen companies bragging about how their clamps can hold odd-shaped workpieces, but nothing holds like my "bag-o-lead" clamping system. And it's less expensive than those specialty clamps.

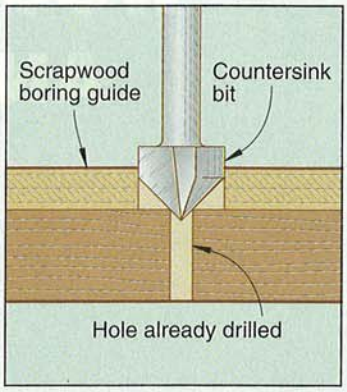
To make mine, I bought some 25-pound bags of #9 shot (for reloading shotgun shells) at a sporting goods store for about $15 each. When I need to glue up an unusual shape, I put the piece to be clamped on my bench and put a bag or two of shot on top of it. They conform easily to most shapes.

The bags are pretty durable, but be careful not to puncture them. The shot is very small and even a tiny hole will quickly cover your shop floor with shot.

—Rick Kling, Chesterfield, Mich.



A surefire way to center a counterbore over an existing hole



When I need a counterbored hole, I normally drill the counterbore first, then the hole. But sometimes, I need to drill a hole through two pieces simultaneously and counterbore both pieces. Sometimes, I decide later that I need a larger counterbore. And frankly, sometimes I just forget and drill the *hole* first. How can I now center a ½" counterbore over that hole?

I make a boring guide by drilling a hole with a ½" Forstner bit in a scrap of ¼" plywood. To center the guide over the hole, I put a standard ½" Stanley countersink into the hole in my workpiece. Next, I slip my boring guide over the countersink and clamp the guide to my workpiece. After popping out the countersink I can now drill the counterbore with my Forstner bit.

—Jan Svec, Assistant Design Editor,* WOOD® *magazine

Continued on page 30

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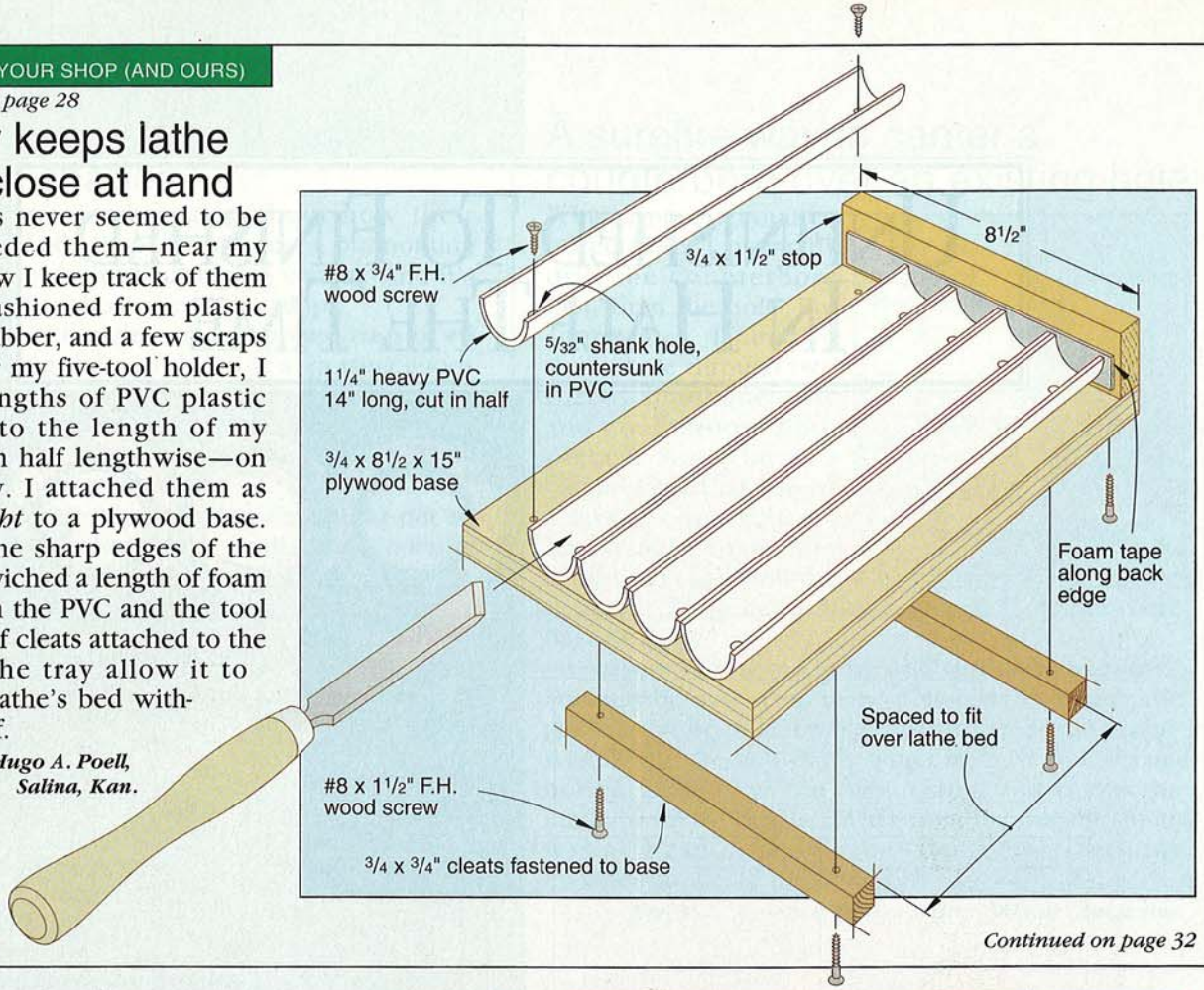
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 28

Tool tray keeps lathe chisels close at hand

Lathe chisels never seemed to be where I needed them—near my lathe. But now I keep track of them in a tray I fashioned from plastic pipe, foam rubber, and a few scraps of wood. For my five-tool holder, I cut three lengths of PVC plastic pipe—first to the length of my tools, then in half lengthwise—on the bandsaw. I attached them as shown at *right* to a plywood base. To protect the sharp edges of the tools, I sandwiched a length of foam tape between the PVC and the tool stop. A pair of cleats attached to the bottom of the tray allow it to straddle my lathe's bed without sliding off.

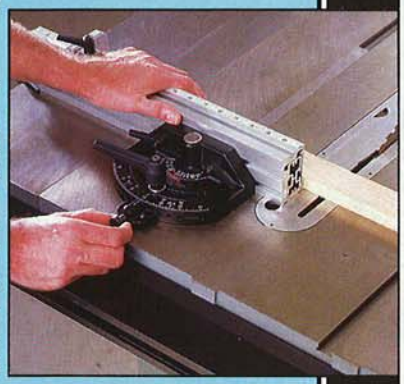
—Hugo A. Poell, Salina, Kan.


#8 x 3/4" F.H. wood screw
3/4 x 1 1/2" stop
8 1/2"
5/32" shank hole, countersunk in PVC
1 1/4" heavy PVC 14" long, cut in half
3/4 x 8 1/2 x 15" plywood base
Foam tape along back edge
Spaced to fit over lathe bed
#8 x 1 1/2" F.H. wood screw
3/4 x 3/4" cleats fastened to base

Continued on page 32

"All my tools should be this good!"

The ***Accu-Miter®*** *is a professional miter gauge that makes perfect angles easily. Shot-pin action assures dead-on accuracy for common angles — plus a precise protractor scale for everything in between!*



We do not recommend operating without the saw blade guard, as is shown here.
US Patent #5,038,486

Optional accessories: manual clamp– pneumatic clamp– 3/8" x 3/4" miter bar–

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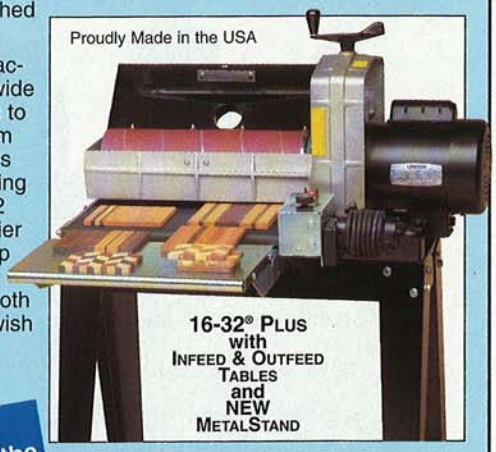

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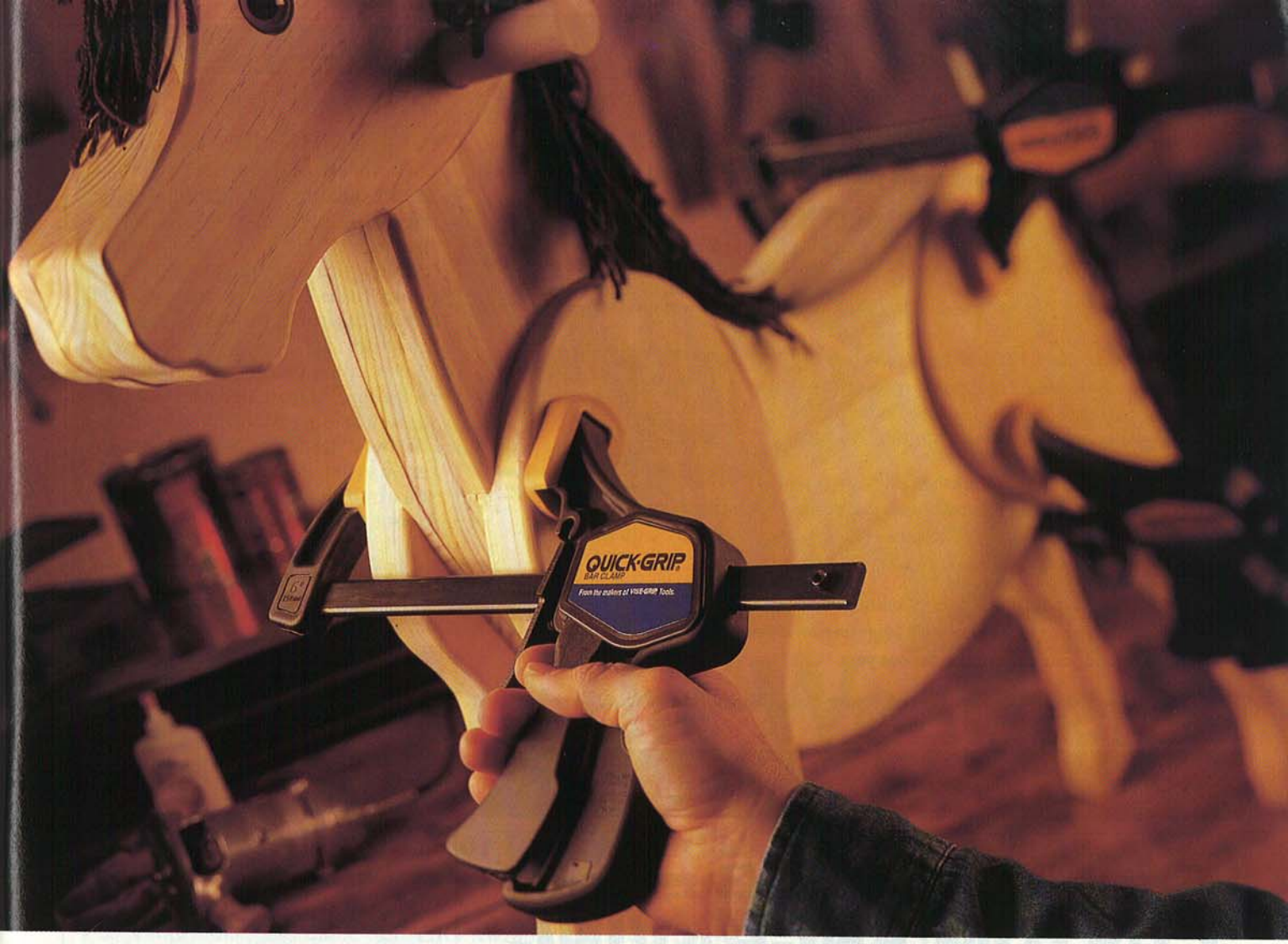

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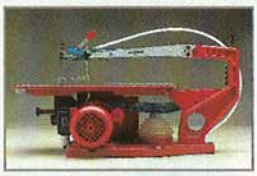

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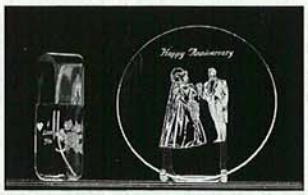

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TIPS FROM YOUR SHOP (AND OURS)

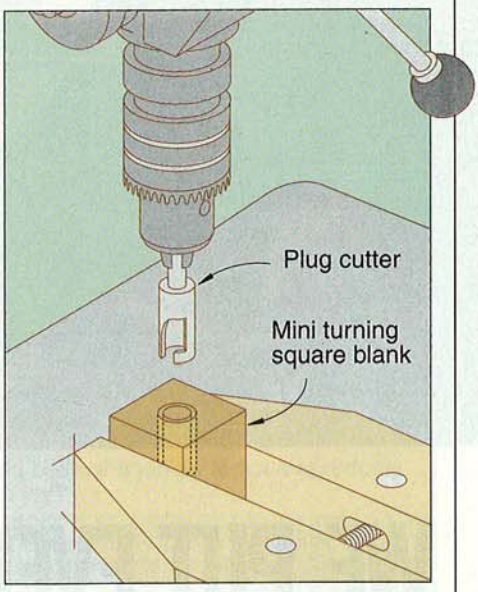
Continued from page 30

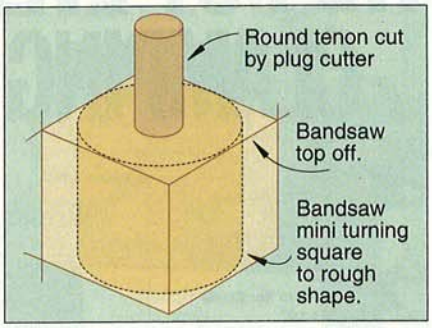
Making small squares for turning tiny parts

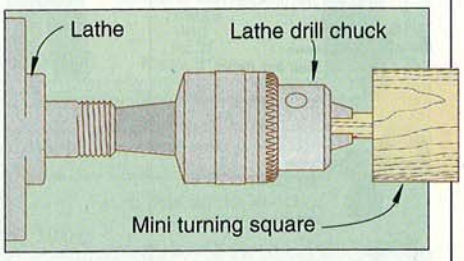
I spend a good portion of every winter building a miniature wooden railroad in my home. Working with the small figures sometimes requires turning parts as thin as ⅛" on my lathe. Here's how I make and mount the small turning squares on my lathe.

I use a plug cutter in my drill press to form a tenon in the blank, as shown *below*. With my bandsaw, I cut away the waste from around the tenon, then rough-cut the turning square to shape. To turn the piece, I mount the tenon in my lathe chuck.

—J. A. Olson, Delta, B.C.







Continued on page 34

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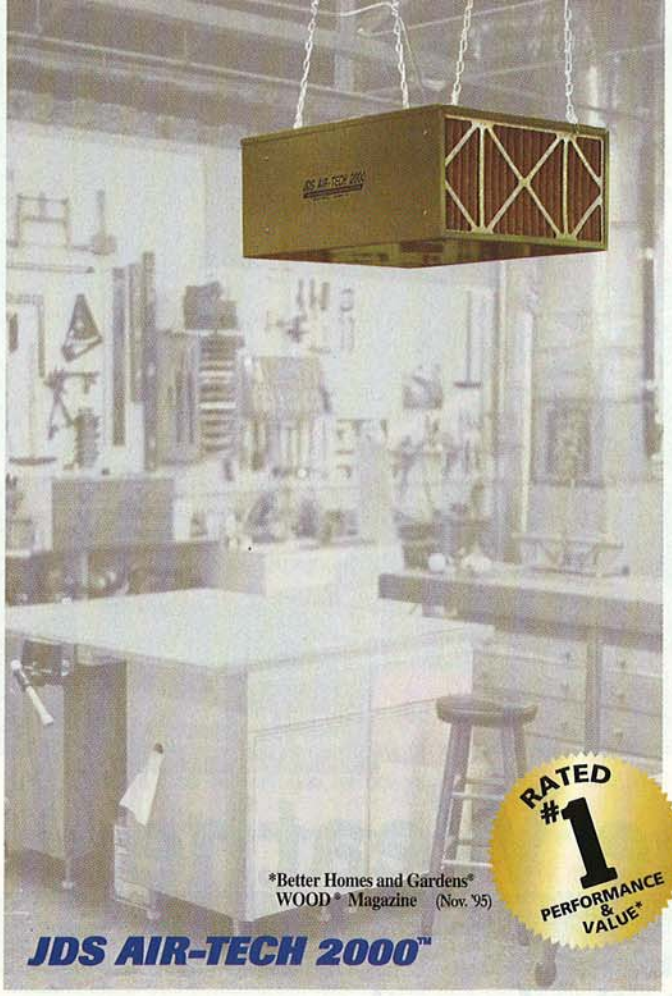

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TIPS FROM YOUR SHOP (AND OURS)

Continued from page 32

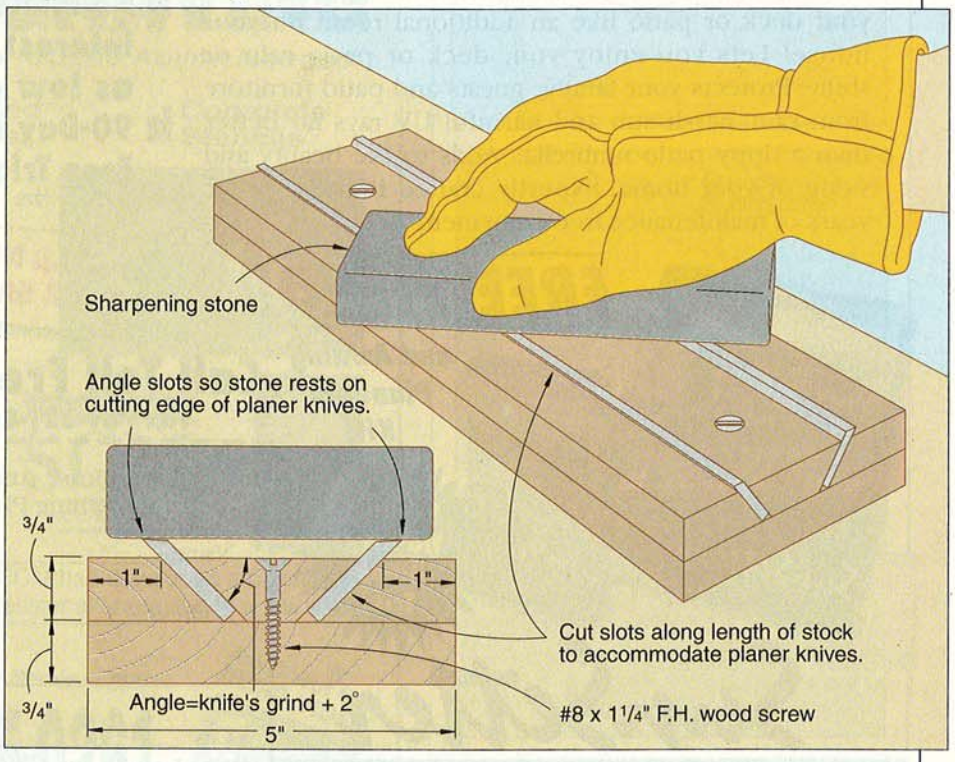
Jig for planer knives helps you hone your own

To keep a keen edge on my planer knives, I hone them regularly. To speed the sharpening process, I made a jig that cuts my honing time in half.

From ¾×5" stock, cut two pieces as long as your planer knives. In one, rip two mirror-image bevels, about 2° more than the angle of the knife's bevel, as shown at *right*. Set aside the wedge-shaped center piece and glue the outside pieces to the other piece of 5" stock where shown. Drill 5/32" shank holes in the center piece, and screw it to the jig's base.

To hone your planer knives, loosen the two screws slightly, slide the knives into the slots, and tighten the screws. Now lay your sharpening stone flat on the cutting edges and slide it back and forth along the knives until they're nice and sharp—I've found that about a dozen strokes does the job.

— Patrick Grasborn, Gilcrest, Colo.



Continued on page 36

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Quickly grinds paint, mastic, stone and concrete. Won't load up.

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Blade cuts grout to remove damaged tile without breaking surrounding tiles or creating excessive dust.

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Easily slices rigid materials like floor tiles, linoleum, carpet, plastic and leather.

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Circle No. 37

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Kitchen design: Lee Wanasella, CKD, Kitchens by Design, Plainview, NY/Photo: Carol Bates

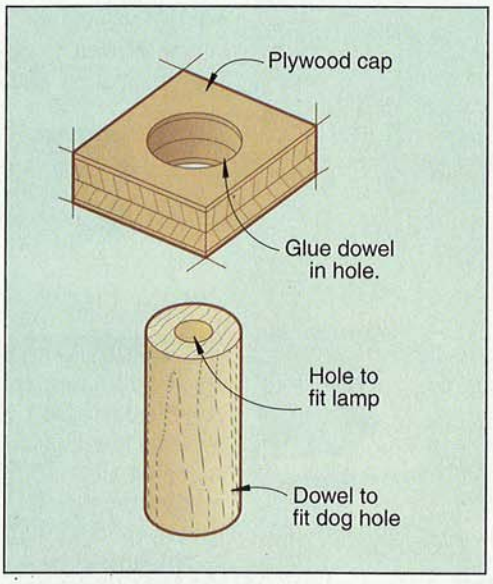
Continued from page 34

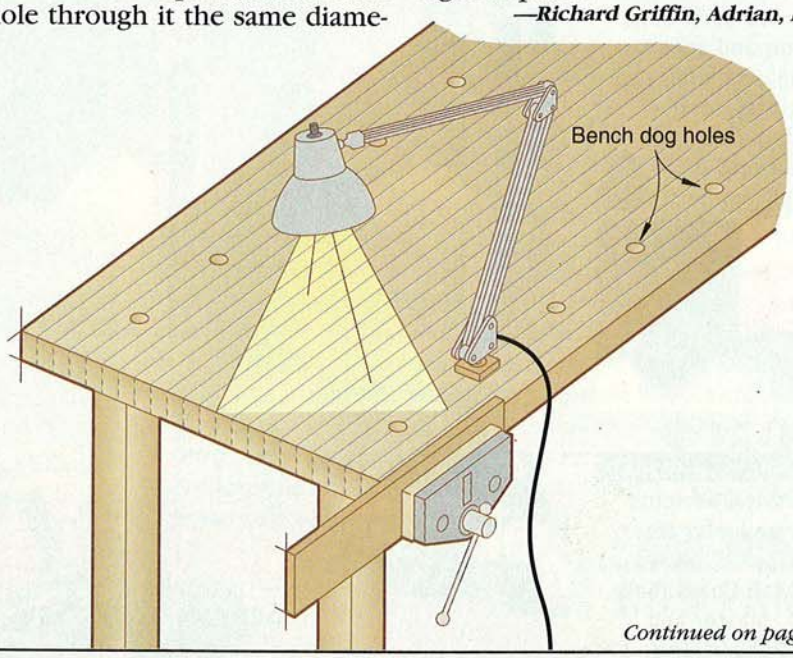
This bright idea sheds light on your workbench

Some time ago in *WOOD®* magazine, I read a tip about drilling a benchtop hole for an adjustable-arm lamp. I have dog holes in my bench, so I made an adapter to hold the lamp in those holes.

In a dowel that fits the dog holes, I drilled a hole in one end to receive the post at the bottom of the lamp. I cut a piece of plywood about 2" square, and drilled a hole through it the same diameter as the dowel. I then glued the dowel into this cap. Now, I just put the adapter in the dog hole nearest my project and pop the light in place.

—Richard Griffin, Adrian, Mich.





Continued on page 38

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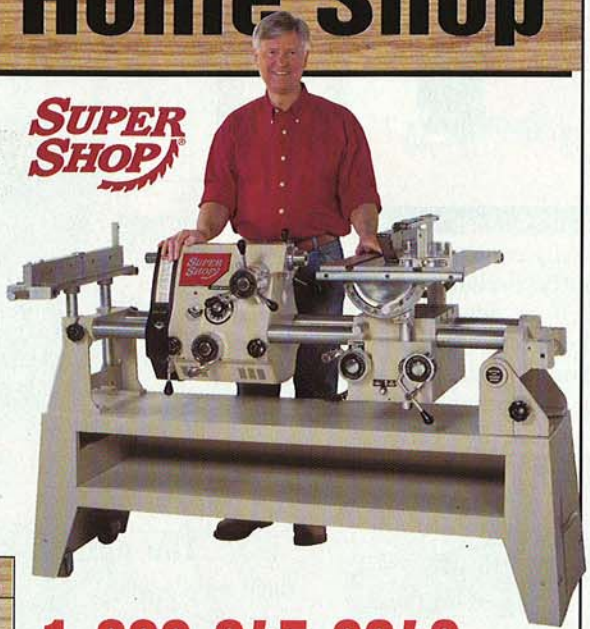

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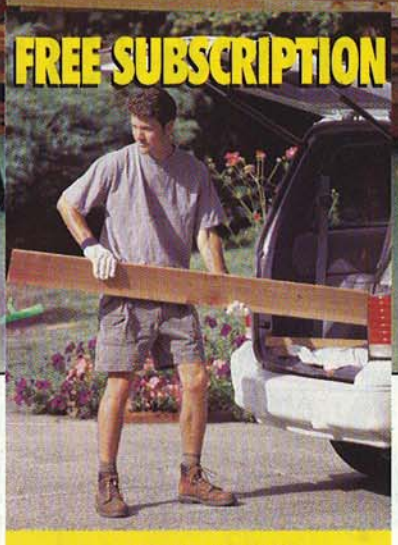

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TIPS FROM YOUR SHOP (AND OURS)

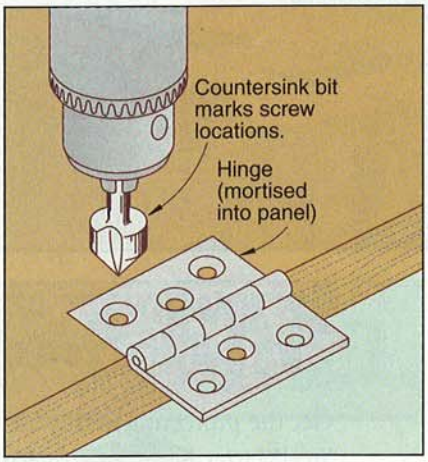
Continued from page 36

Countersink centers hinge screws

Centering screws in hinges can frustrate even a veteran cabinetmaker. It's impossible to do by eye, and if you're only doing a couple of doors, you probably don't want to buy a special self-centering bit to help with the job.

After mortising the hinge into the panel, chuck a countersink bit into your drill and drill into each of the screw holes. Be careful not to enlarge the screw holes or dull the countersink. The lowest point of the countersink is the center of the screw hole.

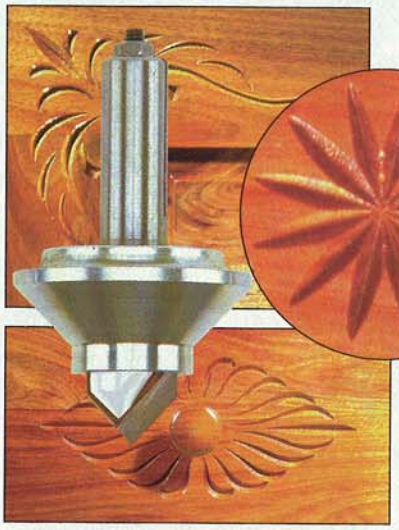
—Jim Downing, design editor, WOOD® *magazine*



A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Accurately drilling holes in dowels can be tricky. It's even harder when you want the holes aligned with one another. See the jig we made to solve the problem on *page 48*.
- On *page74* you'll find a couple of great ways to hide the end grain on a solid-wood glue-up. Both methods allow the wood to freely expand and contract across its width.
- Tired of ill-fitting miter joints? On *page 81* learn Ray Allen's precision measuring and sanding techniques that make any miter joints fit precisely.

How did I carve these?



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. . . Dave Henderson, WOOD® Magazine

American Woodworker

"With a plunge router and (the) new Router Carver System, you can create intricate, repeatable carvings on doors, panels, drawers or any flat wooden surface."
. . . American Woodworker.

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". . . thanks to an exciting new product called 3D Router Carver, anyone with a plunge router can produce handsome results in far less time than would be required using chisels to carve by hand."
. . . R.J. DeCristoforo, Popular Woodworking

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What is the 3D Router Carver™ System?

The 3D Router Carver System is a unique patented method of producing intricate carvings quickly, economically and with complete repeatability. With the Carver Bit, Carver Templates and your 1/2" collet plunge router you can carve any flat wooden surface with designs that rival the work of a professional carver. In fact, the 3D Carver System's speed, accuracy and economy make it attractive to the professional or the serious amateur. Besides your router, the system requires three key elements:

1) The 3D Carver Bit: A 1/2" shank, carbide tipped V-Groove Bit is enclosed in a 45º guide bushing. A threaded shaft within the bit's shank allows precise depth adjustment of the tip of the V-Groove bit.

Bit Specifications: Shank: 1/2" Cut diam.: 3/4" Cut Angle: 45º Cut depth: 5/8" Guide bushing diam.: 1-7/8"

2) Template Holding Frames: Clamped or tacked to your workpiece, these frames hold the 3D Templates securely in place.

3) Carver Templates: A total of over 50 templates produce a host of designs for cabinet doors, panel doors, door rails and corners, drawer fronts and many other applications. Can you make your own templates? You'll find it pretty difficult unless you are a skilled patternmaker. Our templates feature intricate designs cut on computer-controlled machinery with precision that's difficult to match in the shop.

How does the system work?

Using the 3D Carver is easy. The bit is installed in the router (1/2" collet only) with the plunge mechanism unlocked so that the router can move up and down as you rout. The 45º bushing follows the slots in the template. As the slot gets wider, the router moves downward, so the v-groove gets wider. As the slot narrows, the router moves up and the groove gets narrower. That's it!

How do I get started? With our Starter Set!

Classical Door.
Carving size: 17-3/4"x 7-1/4", approx. carving time: 5 min.

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Carving size: 8-1/4" x 2-3/4", approx. carving time: 4 min.

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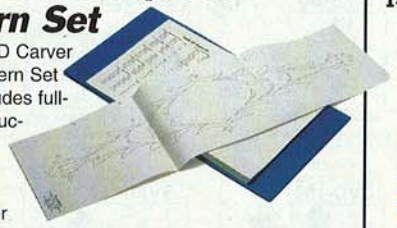

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WOOD ANECDOTE

The bayou beauty with a lot of knee

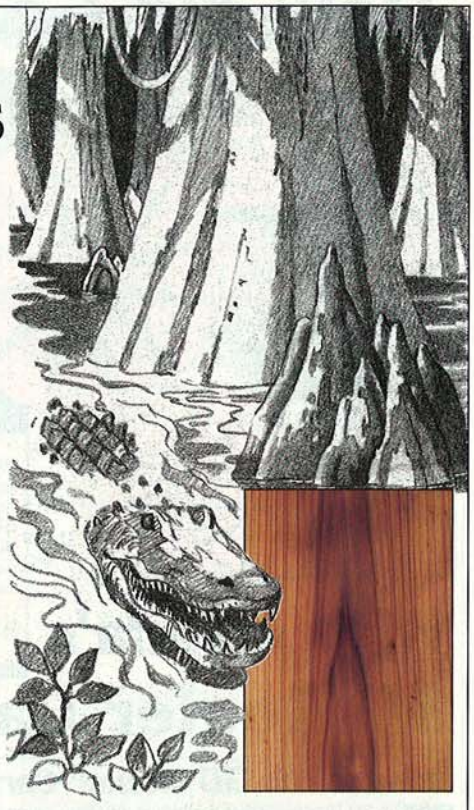
Baldcypress

To woodworkers, a memorable aspect of traveling through the Southeast is seeing the array of curios that can be made from odd-shaped pieces of baldcypress. What major highway intersection, say in rural Florida, doesn't have its entrepreneurial roadside stand displaying clocks, carvings, coffee tables, and other items crafted from the knobby appendages known as "knees"?

Baldcypress (*Taxodium distichum*), an ancient conifer species, thrives in bayous and backwaters where other trees would be swamped. But in this fragile growing base, oddly enough, baldcypress seldom yields to even hurricane winds. That's because its shallow root system spreads out snakelike from the trunk, and every so often sends up above water level an elongated cone. These so-called knees may grow to 6' tall, depending on the high-water mark of the area. They serve as hefty anchors to hold the tree erect. And the size of old-growth trees can be remarkable—heights of 150' with 12' diameters aren't unheard of.

With trees so huge, it's no wonder that stands of baldcypress containing 100,000 board feet per acre have been recorded. Few of those great trees remain today, however. The lumber from them was used long ago for ships, water tanks, flooring, railroad ties, barns, and fences. Yet, their knees linger on; the largest occasionally peeled into the veneer that's called "faux satine."

Illustration: Jim Stevenson



A cousin to the redwood and giant sequoia, the baldcypress can grow to immense size in its backwater home.

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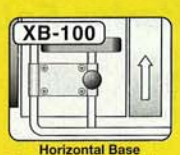

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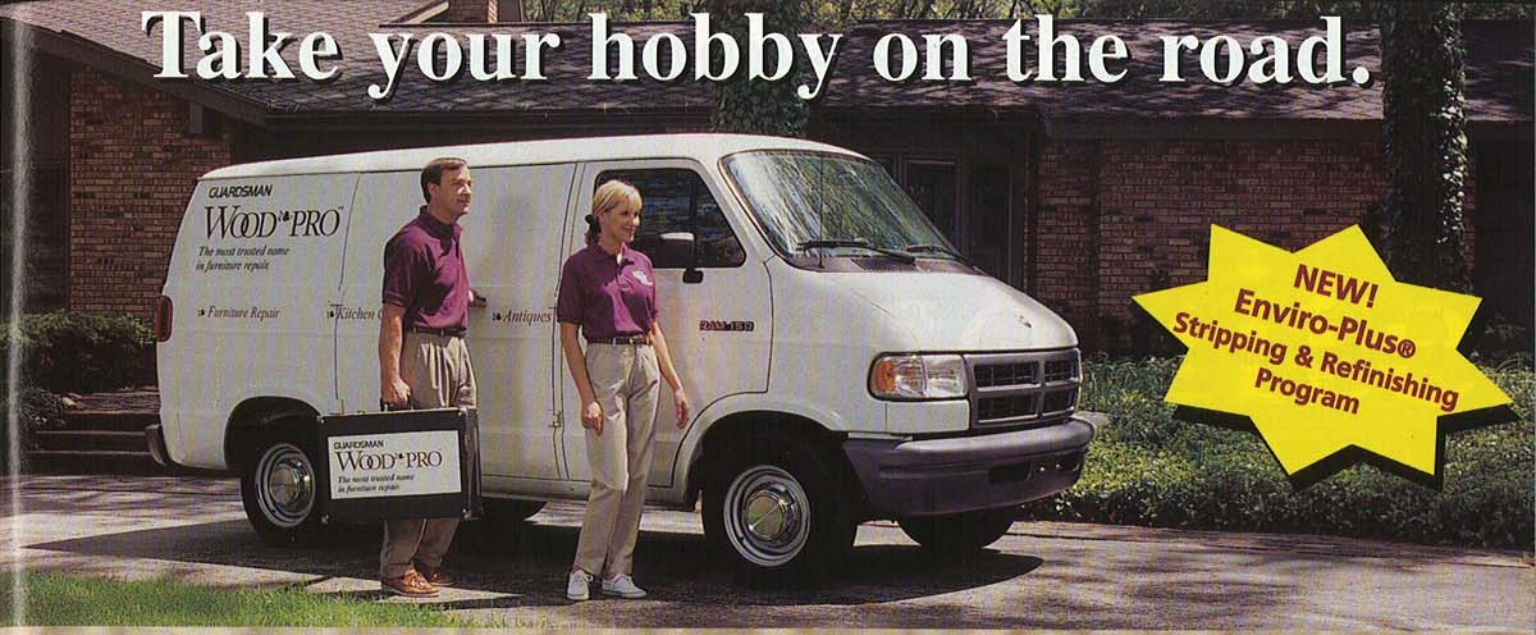

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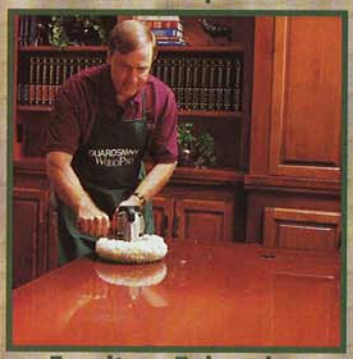
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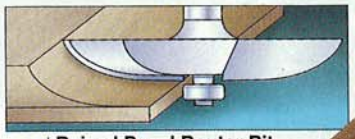

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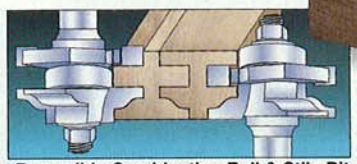

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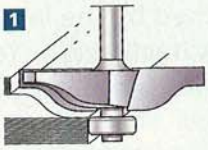

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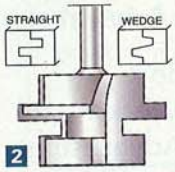

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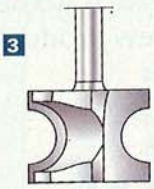

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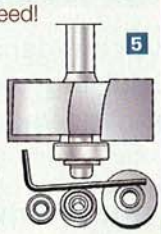

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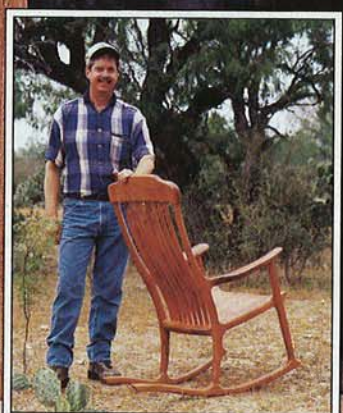
Mesquite Magic

When Texan Robert Hensarling turns his tools to ranchland wood, things get rocking

Continued



At the Spanish Dagger Ranch, Robert Hensarling stands with a rocker in front of a mesquite tree. In the large photo, he installs back slats.

Mesquite Magic

"What are you building, Robert?" inquired the sheriff as he entered the workshop on that sweltering summer day back in 1982.

"I'm building a real fine rocking chair," the craftsman replied.

"Well, what do you want for it?" queried the man with the badge.

"I'm not going to take a penny less than $1,200 for this chair," the craftsman answered.

To this the sheriff said, "I'll give you $900."

"Sold," snapped the craftsman.

So began Robert Hensarling's new career as a maker of rockers. At age 48, the Uvalde, Texas, woodworker now has a professional reputation that stretches far and wide across the Lone Star State and beyond. His elegant, comfortable, native-mesquite rockers grace corporate offices as well as ranch-house living rooms. And it all began—as do many things—in a small way.

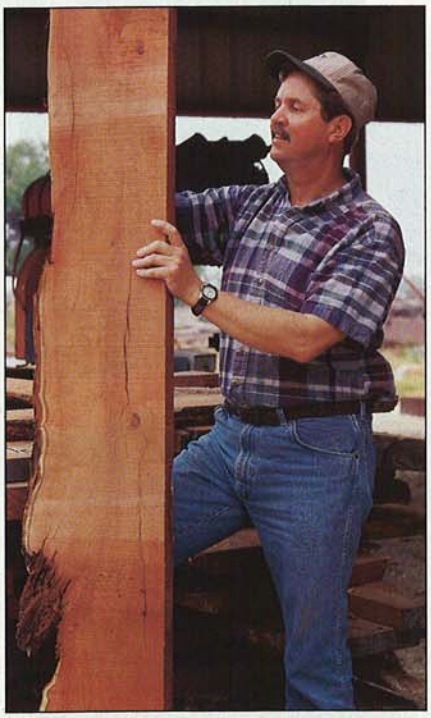
The trade: a badge for a bandsaw

Born the third son of an established Uvalde family, Robert (locally, no one calls him "Bob") gravitated more away from higher education than to it. While his father and brothers focused on finance, the youngest Hensarling found a temporary calling in the U.S. Marine Corps. When his service tour was up, he donned another uniform—that of a law-enforcement officer in his hometown.

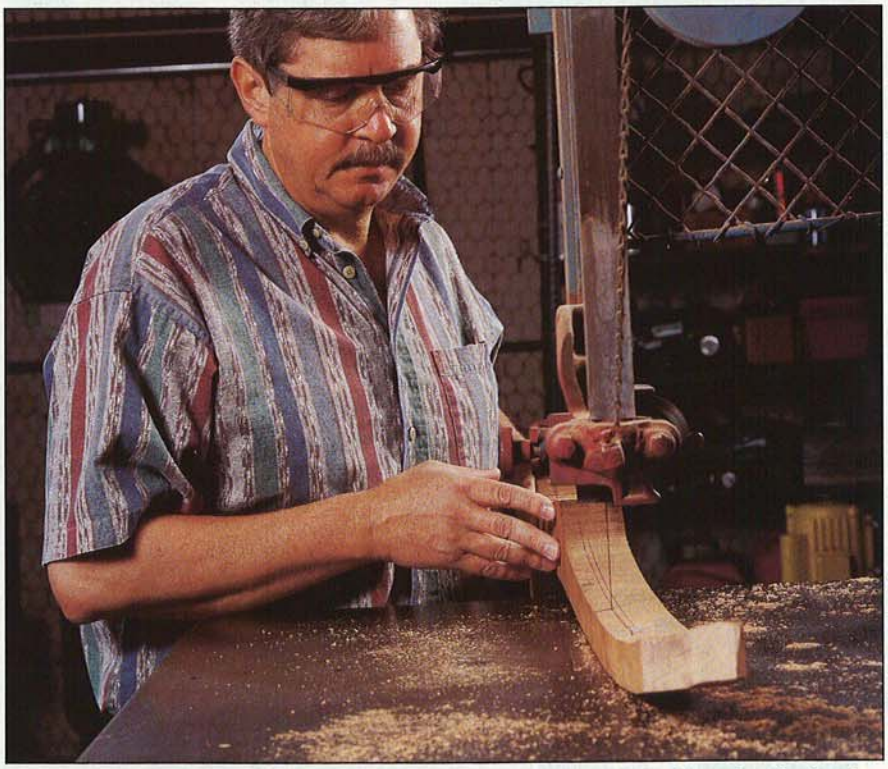
"As much as I enjoyed it back then—in the late 1970s and early 1980s—with the crisp uniform, the shiny badge, the gun, red lights, and all that, it just didn't give me that much personal satisfaction that I'd want to spend a lifetime doing it," says Robert. "So I started developing other things to do, one of which was woodworking."

Robert's dad Bill was an influence then. A retired savings and loan official with a mechanical-engineering degree, Bill had once built a treadle lathe from an old Singer sewing machine. And he had discovered the wonders of a local wood—mesquite—as turning stock.

"He kept talking about how beautiful mesquite was," Robert remembers. "Well, I got to thinking that if I left law enforcement to work with



Mesquite, usually not a big, straight tree, yields only about 10 percent clear wood. The typical board Robert holds has a noticeable wind-shake crack.



At his renovated 1914 Oliver bandsaw, found just north of Mexico, the chairmaker saws out a rocker. He does much of the relieving freehand at the machine.

wood, it should be with mesquite. There were a lot of people working with oak, cherry, and other woods, but few with mesquite."

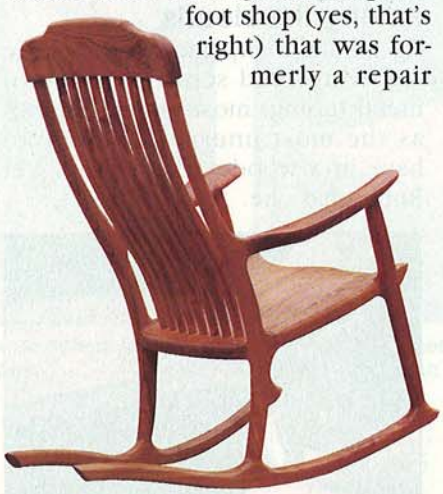
So Robert started experimenting with the dark, reddish brown wood. Mesquite trees grew in abundance on the surrounding ranchlands, and usually were free for the asking, cutting, and hauling.

"My dad had an old Craftsman bandsaw that I first used. But later we found a 1914 Oliver bandsaw just this side of Mexico that we restored—in fact, I still use it," Robert explains. "I started by making bandsawn boxes and turnings from mesquite that I'd give to family and friends. Then I got into selling napkin rings, letter holders, domino sets, and other small stuff—all of mesquite. But eventually I saw this incredible rocking chair done by Sam Maloof in a woodworking magazine and decided to build it. That's the one I sold to the sheriff."

A mesquite rocker to be comfortable in

"Practically everything I've learned to do in wood is self-taught," Robert comments. "So my techniques today may not be what they would be if I'd learned in a school."

Soon after his first rocker sale, Robert and his dad started putting together a serious woodworking shop. "Dad isn't a woodworker, but he's one heck of a machinist, metalworker, and electrician, so we built this shop together," says the chairmaker about his huge 9,000-square-foot shop (yes, that's right) that was formerly a repair garage for semi trucks. "It's Dad who keeps my machines running. That enables me to keep on making rocking chairs."



Robert's Texas Heritage rocker, *above,* sells for $3,000. His Texas Classic, *opposite page,* influenced by Sam Maloof, carries a price tag of $5,500.

Even to an accomplished woodworker, chairs—and especially rockers—pose a real construction challenge. That's because their necessarily sturdy joints require odd angles, and the parts as a whole must comfortably accommodate a seated body. "Well, I've looked at and sat in a lot of rockers, but when you look at the Maloof style that I've patterned mine after, it's not only aesthetically pleasing, but it has curved back slats to support the lower lumbar area. That makes it a comfortable rocker as well as a good-looking one. That's why I experimented with the design.

"Let me say this," he continues. "There cannot be any improvement on an original Sam Maloof-built rocker. That's the best there is and ever will be. What I'm doing is taking the influence that he has given me and modifying it to suit mesquite—and me. I have not improved on the basic Maloof rocking chair."

Robert has, though, improved his chairs. "My first rocking chair was comparatively horrible to sit in," he says. "It didn't have the back support. It didn't have the balance. These chairs now are balanced. When no one is in it, the rockers touch the floor about 2" from the back legs. When you sit in it, it reclines about 10 degrees. If you sit with your legs sticking straight out, it will keep the seat perfectly horizontal. And that's all from how I make the curved rockers."

The chairmaker has found that the secret to balance lies in the soft curve in the rockers that occurs along the 2' ahead of and behind the back leg, the rocker section indicated by Robert in the photo *left*. The rest of the rockers' curve is strictly a design element. "None of Maloof's chairs have this much curve in the rockers, but I like it. It adds a lot of flair and visual balance," he says. "The length of the rockers seems to go with the height of the whole chair."

"This is the critical area of the rocker for perfect balance," says the rocker scientist.

Continued

Mesquite Magic

Texas, home of the one-ton mesquite table

According to Robert, people buy his work because they like the grain of the mesquite and its color, the craftsmanship, and the lines of the chair. They're willing to pay big money for them, too.

"My Texas Classic, which is the Maloof-inspired design, sells for $5,500," says Robert. "So far, I've done 144 of those. The other, the Texas Heritage, which is my original design, sells for $3,000. I've done two chairs of burled mesquite that sold for $12,000 each. But it took about six years for me to gather enough solid mesquite burl to make them."

The Uvalde craftsman also makes, on custom order, office desks and conference tables and chairs. And one of his tables holds the record—documented by the Texas Forest Products Laboratory—as the largest piece of furniture ever made from native mesquite.

"It was 17' long and 54" wide, with a top 3" thick," Robert recalls. "The whole thing weighed a little over a ton. It took 20 of us just to carry the top in. I made it for George Baker, the head of a New York investment firm and the great-grandson of J.P. Morgan. It sits in the meeting room of his ranch house here in Texas. He asked how long it would take to make, and when I told him about a year, he said, 'Well, that's okay, I've got to build a house for it to go in.' "

For conference tables and matching chairs, Robert receives $5,000 per place setting. The monster mesquite table was designed to seat 16 people.

Finding trees among the clouds

An ultralight airplane, with its large red wings and scrawny frame of metal tubing, most certainly ranks as the most unusual machine to have in a woodworking shop. Yet Robert has one.

With a die grinder, Robert takes off wood to round the back leg-arm joint. Sanding will later smooth it.

"Believe me, I like soaring around up there," he says, directing a finger skyward. "I've had one for several years as a hobby. Sometimes, though, I do spot the canopy of a big old mesquite tree that I might someday come back for."

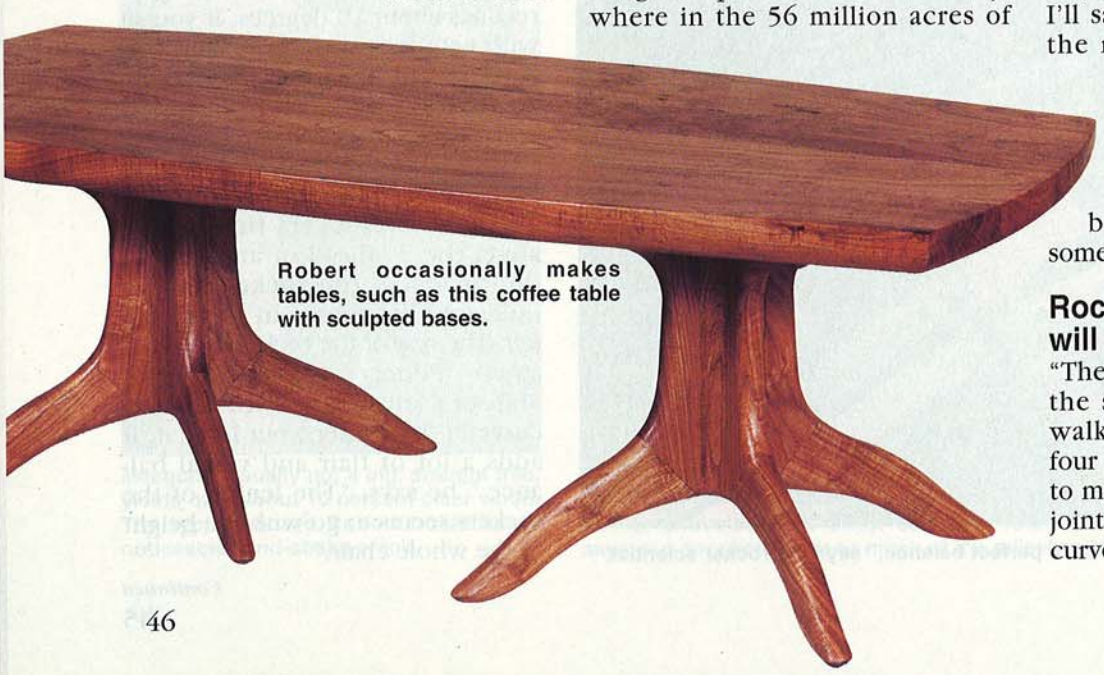
Big mesquite trees are rare anywhere in the 56 million acres of Texas landscape. They just don't grow to the size of hardwoods like ash, cherry, and oak. And the typical mesquite log can contain bark and resin pockets, swirling grain, ring shake (called wind shake in Uvalde), and splits. A clear board 6' long and 8" wide is something Robert would consider precious.

"With mesquite, the yield is only about 10 percent clear lumber," he notes. "But one of its faults that I've used to my advantage is the wind-shake crack that it almost always has inside. I fill that wind-shake crack with black epoxy to make it look natural."

Because Robert harvests his own wood, saws it into boards, and dries the boards, he feels that he doesn't need to carry a large inventory of wood. "I make about 18 rockers a year, and because I begin with the tree, each of them becomes something special," he says.

Under a tin canopy outside the shop, a Wood-Mizer portable bandsaw mill divides the mesquite logs into boards. Then Robert dries them in a dehumidifying kiln with a vacuum chamber made from a 1,000-gallon tank. It holds 250 board feet.

"Drying wood was the bottleneck that kept me from keeping up on orders," Robert says. "But even with it, I don't really have much of an inventory of dried wood. What I do is, when someone orders a chair, I may go and cut the log right then. I'll saw out the rough lumber for the rockers and arms, then put them in the kiln for two weeks. They'll go from 60 percent moisture to 7 percent. That way I don't carry an inventory of precut parts, because someone may want something different."

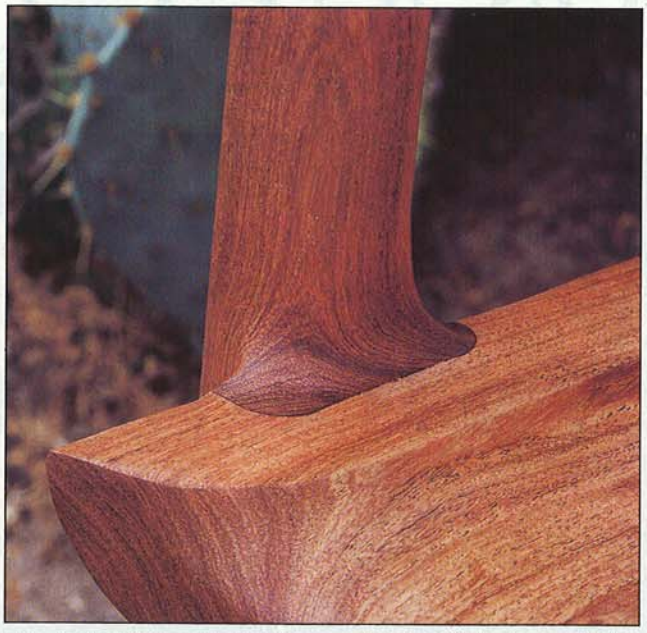


Robert occasionally makes tables, such as this coffee table with sculpted bases.

Rocking chairs that will never fall apart

"The starting place for a rocker is the seat," Robert explains as he walks to the workbench. "I take four or five pieces of 8/4 mesquite to make up a 21×21" seat blank and joint their edges. Then I draw the curve on the top edge of each seat

Robert demonstrates the two parts of the sculpted, locking-mortise joint he uses on the seats of his chairs.



This is the finished locked-tenon joint that Robert named after renown craftsman Sam Maloof.

board and also mark the biscuit positions for joining. Before I glue the seat up, I rough-shape each board on my old bandsaw."

Like most woodworkers who produce more than one of the same piece of furniture, Robert uses patterns and templates for the rockers, arms, legs, back slats, and headpiece. Like the seat, he saws them all to rough shape and relieves them on the bandsaw. Round parts get further rounded on his overhead pin router.

"One of the keys to a good rocking chair is the leg joint with the seat," advises the craftsman. "The joint I use was taught to me by Sam Maloof in a seminar I took at Anderson Ranch Arts Center in Snowmass, Colorado. He called it the California joint, but I call it the Maloof joint. It's just a sculpted locked mortise and tenon [see photo *above left*]. The joint is splayed out, not 90° up and down. I cut it on the pin router, but it could be done with a regular router, too."

Back slats are another secret to a good rocking chair. Says Robert, "I have a couple of templates for them, although each one has the same contour for lumbar support. Maloof uses seven slats in his rocker. For my Texas Heritage rocker, I went to eight for more back support and comfort."

To show how important support is, Robert tells of the time a few years ago when he broke his back in a New Mexico skiing accident. "From the hospital, I called a doctor friend in San Antonio who had one of my rocking chairs. Because he couldn't practice there, he told me to have them put a brace on and then see him. After examination, his advice was for me to go home and sit in one of my rockers for six weeks because that's the best back support he knew. And it worked."

Support. Comfort. Both count heavily in the success of Robert's rockers. But there's durability and finish, too.

For durability, mesquite is tough—about two and a half times stronger than red oak. And Robert joins it in his chairs with System Three epoxy—not just for strength, though. "I used woodworking glues early on, but now I like epoxy because it sets slower, and it's gap-filling," he explains. "I usually do all my gluing at the end of the day so it cures overnight and I can work the glue-ups in the morning."

For a clear finish, Robert gives his customers two options. "For real gloss, I put on Tru-Oil gunstock finish that's rubbed in after sanding with 320-grit," he says. "If they want a flatter finish, I spray on Deft semigloss lacquer after sanding with 220-grit. I never wax over anything because if I have to refinish a piece, the wax is terrible to remove. Plus, it has to be renewed."

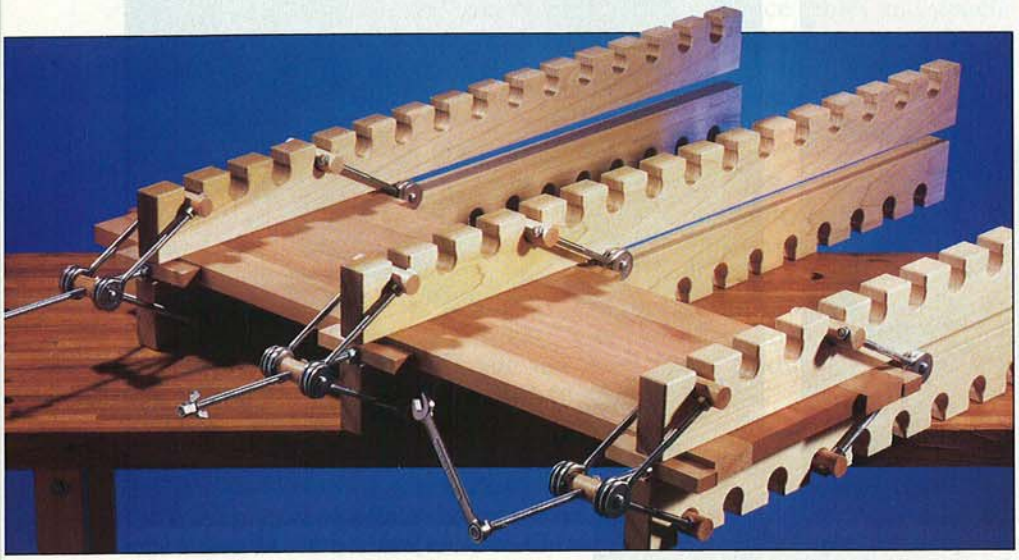
Robert feels so confident in his chairs' durability that he gives them a lifetime guarantee. "Yeah, mine!" he says with a grin.

Get to know the Texas rocker scientist

Robert offers two-day seminars on rocking-chair building as well as one-on-one instruction. For more information, write Robert Hensarling, 4326 Highway 90 East, Uvalde, TX 78801. Visit his Web site (www.mesquite-furniture.com) for rocker plans and other material. For a free pamphlet about mesquite, send a business-size SASE to Texas Forest Products Laboratory, P.O. Box 310, Lufkin, TX 75901.

Written by Peter J. Stephano Photographs: Bob Hawks

PRESSURE-PACKED PANEL CLAMPS



Edge-joining several boards to make a flat panel can frustrate even the most patient woodworker. But, these shop-built panel clamps end all the hassles. We recommend that you make a set of three for starters. Build them as shown here, and turn to *page 50* for tips on using them.

1 From 1" dowel stock, crosscut the cross dowels (A, B, C) to the lengths listed on the Exploded View drawing on the *opposite page*.

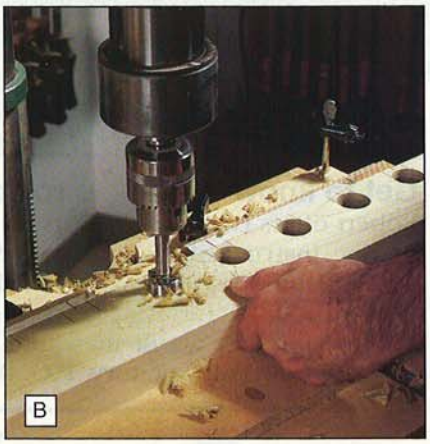
2 To keep the dowels from splitting out the bottom side when drilling through them, we recommend making a drill-table support. To do this, cut two pieces of ¾×1½×12" stock. Rout a ½" cove along one edge of each. Glue the two pieces together in the configuration shown in *Photo A*.

To keep the counterbores and holes aligned, we drilled the first depression and inserted a short length of ⅝" dowel stock into the counterbore. Then we aligned the dowel vertically with the bit before drilling the second counterbore.

3 Center the coved assembly under a ⅝" Forstner bit chucked into your drill press. Use a stop to keep the center of the counterbores 9/16" from the ends of each cross dowel A. Drill a pair of counterbores ¼" deep into each cross dowel as shown in the photo and on the Parts View drawing on the *WOOD PATTERNS*® insert in the center of the magazine.

4 Switch bits, and drill a ⅜" hole centered in each counterbore.

Use a drill press with a fence and Forstner bit to drill the holes used to form the notches in the clamp bars.



5 Repeat the process for cross dowels (B, C), centering the holes in the dowels. See the Parts View for hole sizes in the dowels.

6 Push a ⅜" T-nut into the 7/16" hole in cross dowel B hard enough so the prongs indent the dowel. Remove the T-nut, and drill ⅛" pilot holes at each indentation. The pilot holes prevent the prongs on the T-nut from splitting the dowel later.

7 Use a rasp to form notches in the top and bottom of the cross dowel C. Then, grind the head of the carriage bolt that will be inserted through the cross dowel C flush with the notches.

8 Cut the clamp pads (D) to size and shape, counterboring, and drilling each where shown on the Parts View drawing.

9 Cut the clamp bars (E) to size. (We used poplar; you could also use 2×4 stock if you plane the edges flat and parallel.)

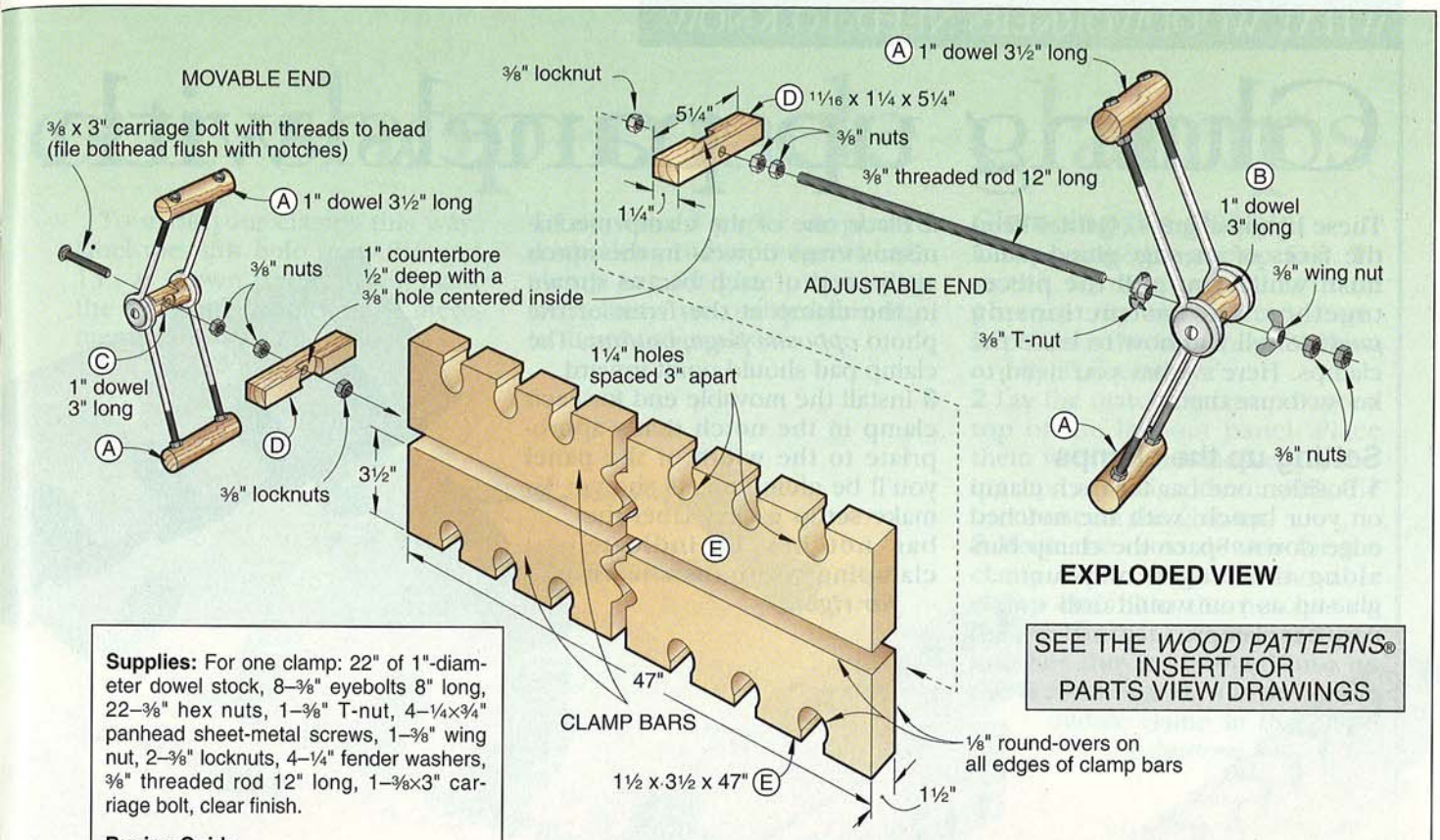
10 Using your drill press fitted with a fence and a Forstner bit, drill 1¼" holes 3" apart where shown on the Parts View and *Photo B*.

11 Attach an extension to your miter gauge, and make a pair of cuts at each hole to create the opening as shown on the Notch detail on the Parts View.

12 Rout ⅛" round-overs on all edges, making the bars easier and safer to handle. Sand the bars and add a clear finish.

13 Assemble the sliding and tightening ends in the configuration shown on the Exploded View and Clamp Mechanism drawings. Keep the nuts and ends of the eyebolts flush with each other. If the bolt protrudes beyond the nut, you'll mar your workbench when using the clamps later.

14 Secure the two ⅜" nuts and wing nut to the end of the 12"-long, all-thread rod with thread lock. [We used high-strength (red) Loctite, 271.] For ease and speed in loosening and tightening the clamp ends, skip the wing nuts and use a 9/16" box end wrench.



EXPLODED VIEW

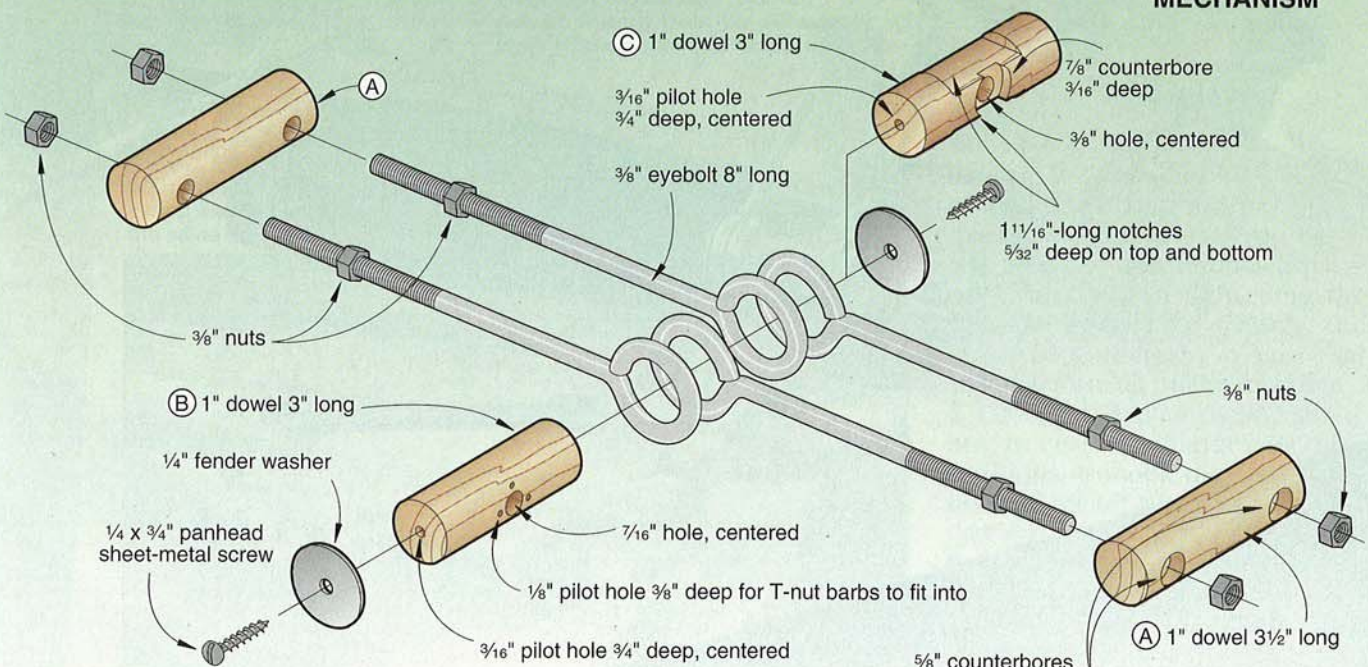
SEE THE *WOOD PATTERNS®* INSERT FOR PARTS VIEW DRAWINGS

Supplies: For one clamp: 22" of 1"-diameter dowel stock, 8–⅜" eyebolts 8" long, 22–⅜" hex nuts, 1–⅜" T-nut, 4–¼x¾" panhead sheet-metal screws, 1–⅜" wing nut, 2–⅜" locknuts, 4–¼" fender washers, ⅜" threaded rod 12" long, 1–⅜x3" carriage bolt, clear finish.

Buying Guide

Hardware. All the hardware (not including the finish) listed in the Supplies listing *above*. Kit no. WDPC, $24.99 ppd./clamp or two for $44.99 ppd. Miller Hardware, 1300 M.L. King Pkwy., Des Moines, IA 50314 or call 515/283-1724 to order.

CLAMP MECHANISM


Ⓒ 1" dowel 3" long
7/8" counterbore 3/16" deep
3/16" pilot hole ¾" deep, centered
⅜" hole, centered
Ⓐ
⅜" eyebolt 8" long
1 11/16"-long notches 5/32" deep on top and bottom
⅜" nuts
⅜" nuts
Ⓑ 1" dowel 3" long
¼" fender washer
¼ x ¾" panhead sheet-metal screw
7/16" hole, centered
⅛" pilot hole ⅜" deep for T-nut barbs to fit into
3/16" pilot hole ¾" deep, centered
Ⓐ 1" dowel 3½" long
5/8" counterbores ¼" deep with ⅜" holes centered inside

Written by Marlen Kemmet
Project Design: Dan Johnson, Des Moines, Iowa
Illustrations: Kim Downing; Lorna Johnson
Photographs: Marty Baldwin; Hetherington Photography

Gluing up panels with

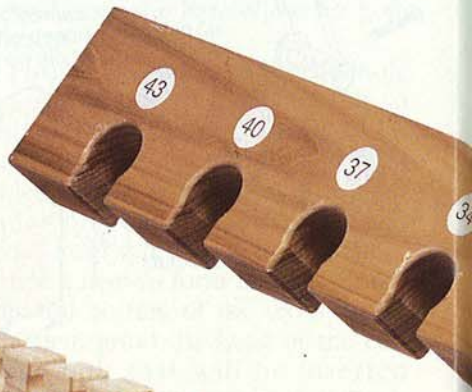
These handy clamps (*below*) keep the faces of an edge-glued panel flush while you pull the pieces together. The instructions on *page 48* tell you how to build the clamps. Here's what you need to know to use them.

Setting up the clamps

1 Position one bar for each clamp on your bench, with the notched edge down. Space the clamp bars along the length of your glue-up as you would ordinary bar clamps.

2 Place one of the clamp mechanism's cross dowels in the notch at the end of each bar, as shown in the clamp at the front of the photo *opposite page, bottom*. The clamp pad should point inward.

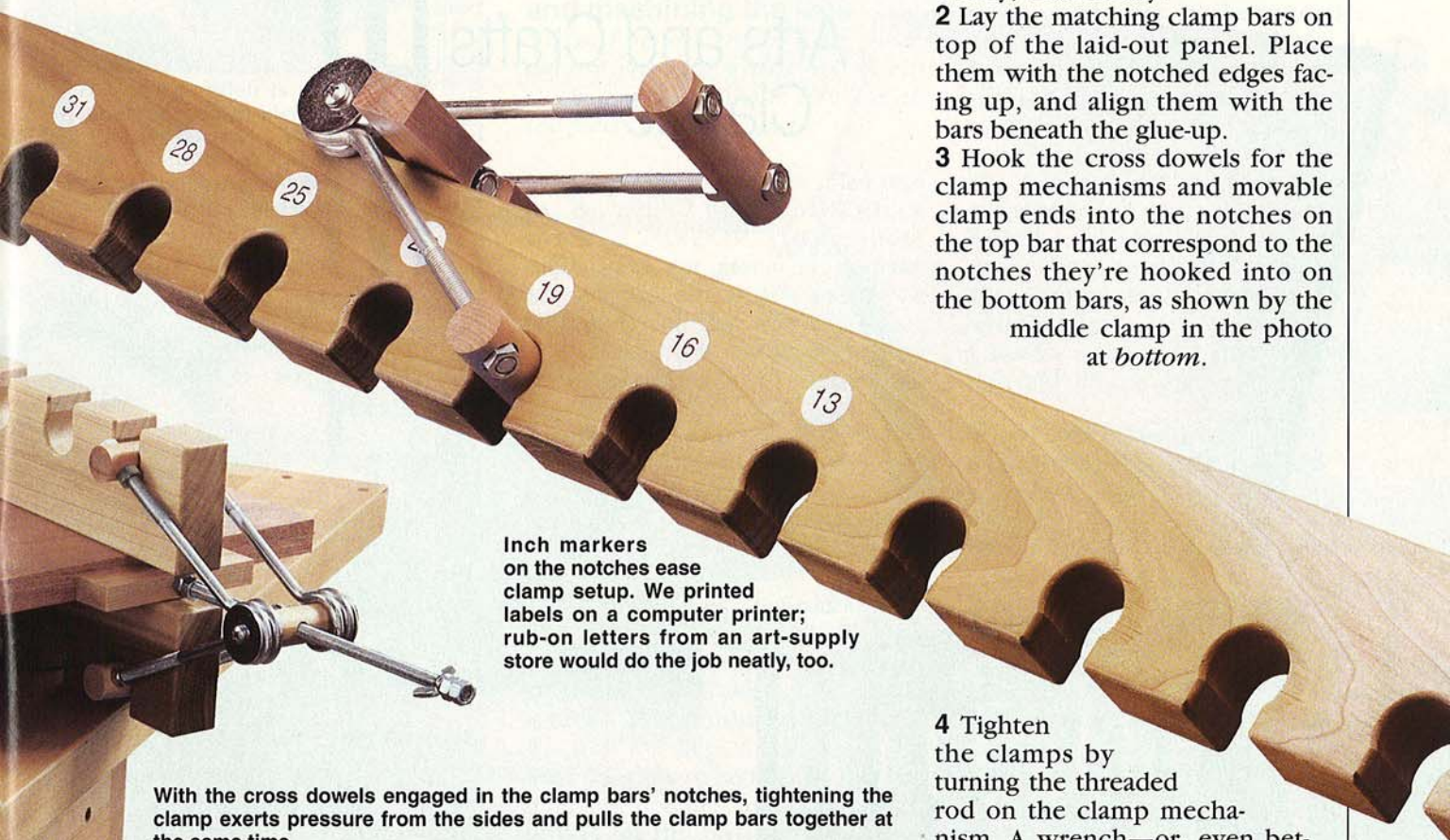
3 Install the movable end for each clamp in the notch that's appropriate to the width of the panel you'll be gluing up, as shown. To make setup easier, label the bar notches to indicate clamping width, as shown *far right*.



our shop-made clamps

To mark your clamps this way, label the fifth hole from the end 13", as shown *below*. Then, mark the subsequent holes in 3" increments (16", 19", 22", etc.) to 43".

4 Lay waxed paper or plastic wrap along the top edge of each clamp bar for glue protection. (For clarity, we omitted this step in the photographs.)



Inch markers on the notches ease clamp setup. We printed labels on a computer printer; rub-on letters from an art-supply store would do the job neatly, too.

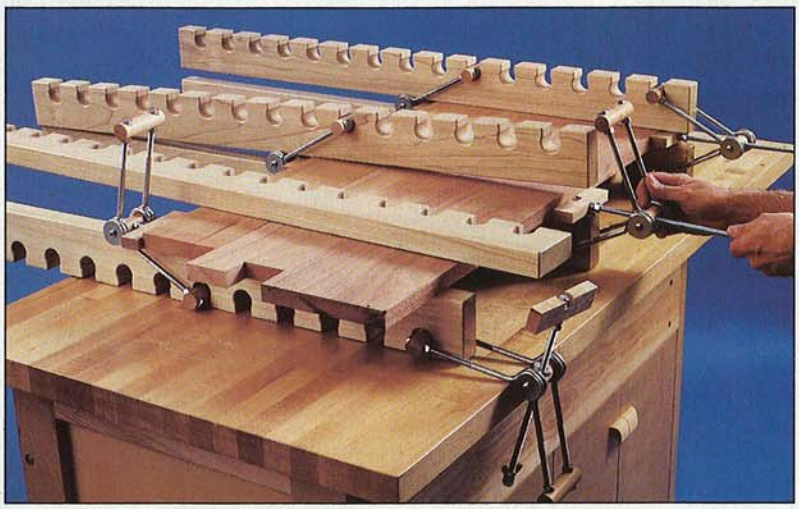
Clamping the glue-up

1 Dry-clamp the glue-up first. To do this, lay the components of the glue-up on the clamp bars. Reposition the bars to space them evenly, if necessary.

2 Lay the matching clamp bars on top of the laid-out panel. Place them with the notched edges facing up, and align them with the bars beneath the glue-up.

3 Hook the cross dowels for the clamp mechanisms and movable clamp ends into the notches on the top bar that correspond to the notches they're hooked into on the bottom bars, as shown by the middle clamp in the photo at *bottom*.

With the cross dowels engaged in the clamp bars' notches, tightening the clamp exerts pressure from the sides and pulls the clamp bars together at the same time.



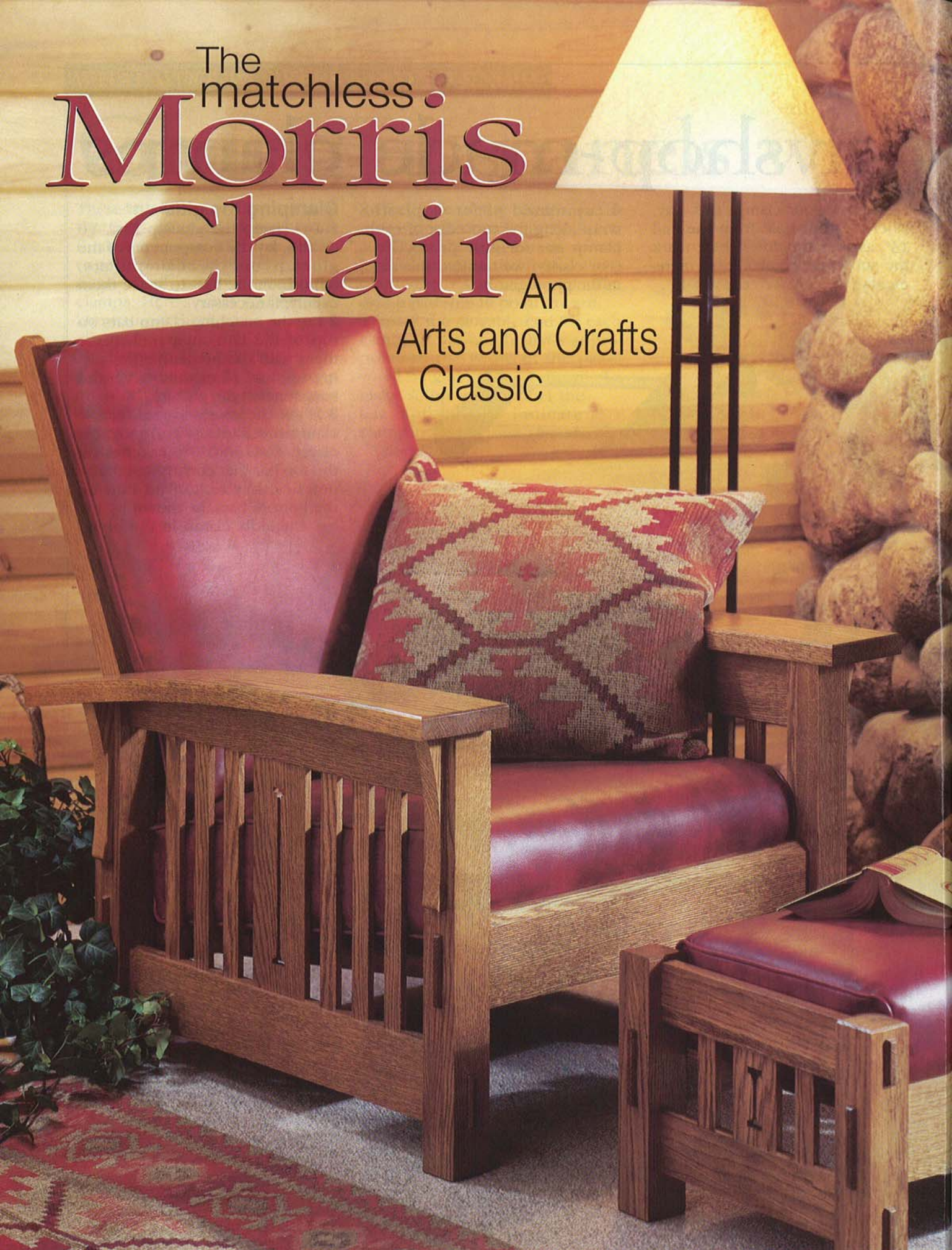
4 Tighten the clamps by turning the threaded rod on the clamp mechanism. A wrench—or, even better, a socket and ratchet drive—will assist you in tightening the clamps securely. Check the clamped glue-up to ensure that the edges are all pulled together.

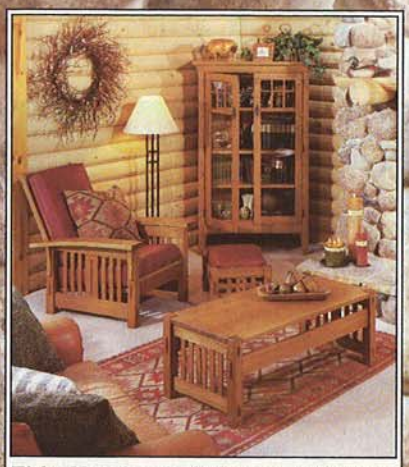
5 Loosen the clamps and make any necessary changes in their positions. Unhook the cross dowels, and lift off the top bars. Take care not to move the clamps.

6 Apply glue to the panel pieces. Replace the top clamp bars, laying waxed paper or plastic wrap between them and the glue-up.

7 Finally, reengage the cross dowels, and tighten the clamps.

Photographs: Hetherington Photography; Baldwin Photography


The matchless
Morris Chair
An Arts and Crafts Classic



This Morris chair is the first in a series of mission pieces you'll see in future issues of *WOOD*® magazine. The ottoman and coffee table will appear in the next issue and the bookcase in the August 1999 issue.

Believed to have originated with William Morris, father of the English Arts and Crafts movement, the so-called Morris chair combines comfort with simply stated good looks. True to form, our version features loose cushions, curved arms, and an adjustable back. We'll tell how to make the cushions, as well as provide a mail-order source.

Let's start by laminating and machining the legs

Note: *For an authentic look, choose straight grain or rift-cut stock, preferably white oak, for all the pieces of this project.*

1 To form the 2¼"-square chair legs (A, B), cut 12 pieces of ¾"-thick stock to 2⅜×22¾". (Using these dimensions, the pieces are initially ⅛" oversize in width and 1" in length so you can trim the edges and ends of the laminated legs to final dimensions later.) See the Legs drawing for reference.

2 Spread an even coat of glue on the mating surfaces of three pieces making up each leg. With the edges and ends flush, glue and clamp the pieces face-to-face to form the front and rear legs.

3 Cut or plane an equal amount off both edges of each leg (A, B) for a 2¼" finished width. Then, trim an equal amount off both ends of each leg for a 21¾" finished length.

4 Using the Legs drawing on the *next page* for reference, lay out the mortises, notches, and hole centerpoints on the *outside* surface of each leg where dimensioned. *(To ensure any possible chip-out would be on the inside surface and covered by the rail and stretcher tenon shoulders later, we marked the mortises on the outside surfaces. We also drilled from the outside surface so the bit came through on the inside surface.)*

5 Attach a wood top and fence to your drill-press table. Or, as shown in *Photo A*, use our drill-press table from the February 1996 issue, #86, of *WOOD*® magazine. See the Buying Guide with the Bill of Materials for a *WOOD PLAN* of the jig if you don't have the back issue. Using a 7⁄16" brad-point bit, drill holes inside the marked mortise outlines as shown in *Photo A*. Squareup the mortises with a chisel. You could also form the mortises with a mortiser. See our review of these handy benchtop tools in the August 1998 issue of *WOOD* magazine.

6 Drill a ⅝" hole 1⅝" deep on the *inside* face of each 2¼"-square rear leg (B) to house the lower backrest pins (V) later.

7 Rout a ⅛" chamfer along the bottom end of each leg.

Now, machine and assemble the side frames

1 Cut the lower rails (C) and upper rails (D) to the sizes listed in the Bill of Materials from five-quarter (1 1⁄16") stock.

2 Fit your tablesaw with a ⅜" dado blade, and cut a ⅜" groove ½" deep, centered along one edge of each rail. See the Side Frame drawing and accompanying Tenon details for reference.

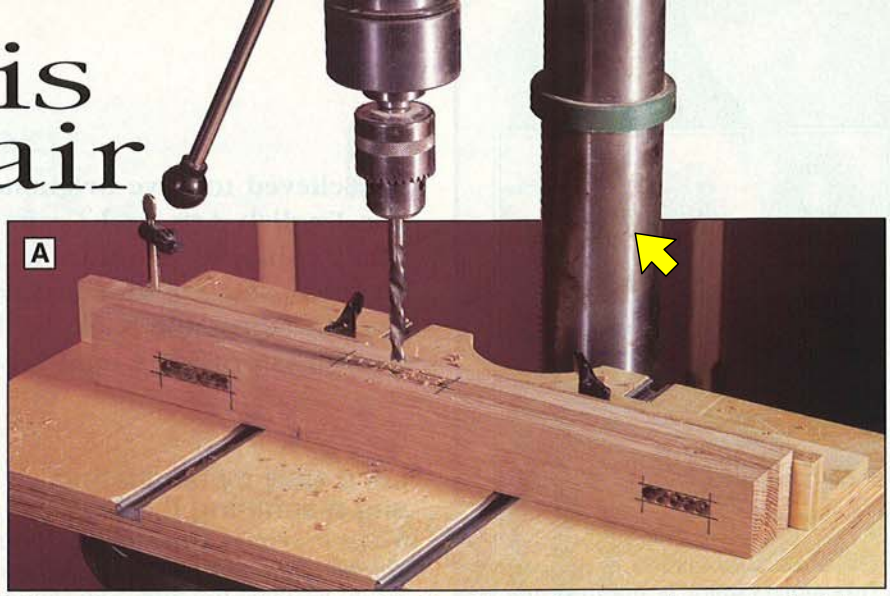
3 Switch to a wider dado blade on your tablesaw. Then, attach a long wooden extension to your tablesaw's miter gauge, and square the extension to the blade. Using a stop for consistency, cut rabbets to form tenons on the ends of the rails (C, D). (We test-cut scrap stock first to ensure a tight fit of the tenons into the leg mortises.) See the Upper and Lower Rail Tenon details accompanying the Side Frame drawing for dimensions.

4 Sand or file the chamfers on both ends of the through tenons on the lower rails (C) where shown on the Lower Rail Tenon detail. If you have a small router, such as a laminate trimmer, use a chamfer bit in it to machine the tenon ends.

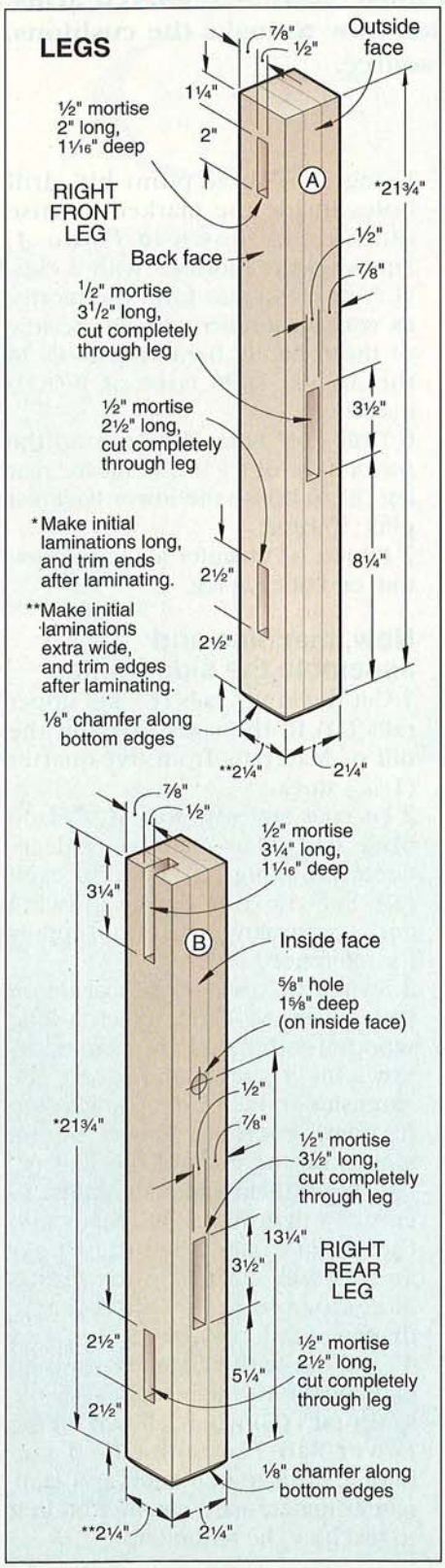
Continued

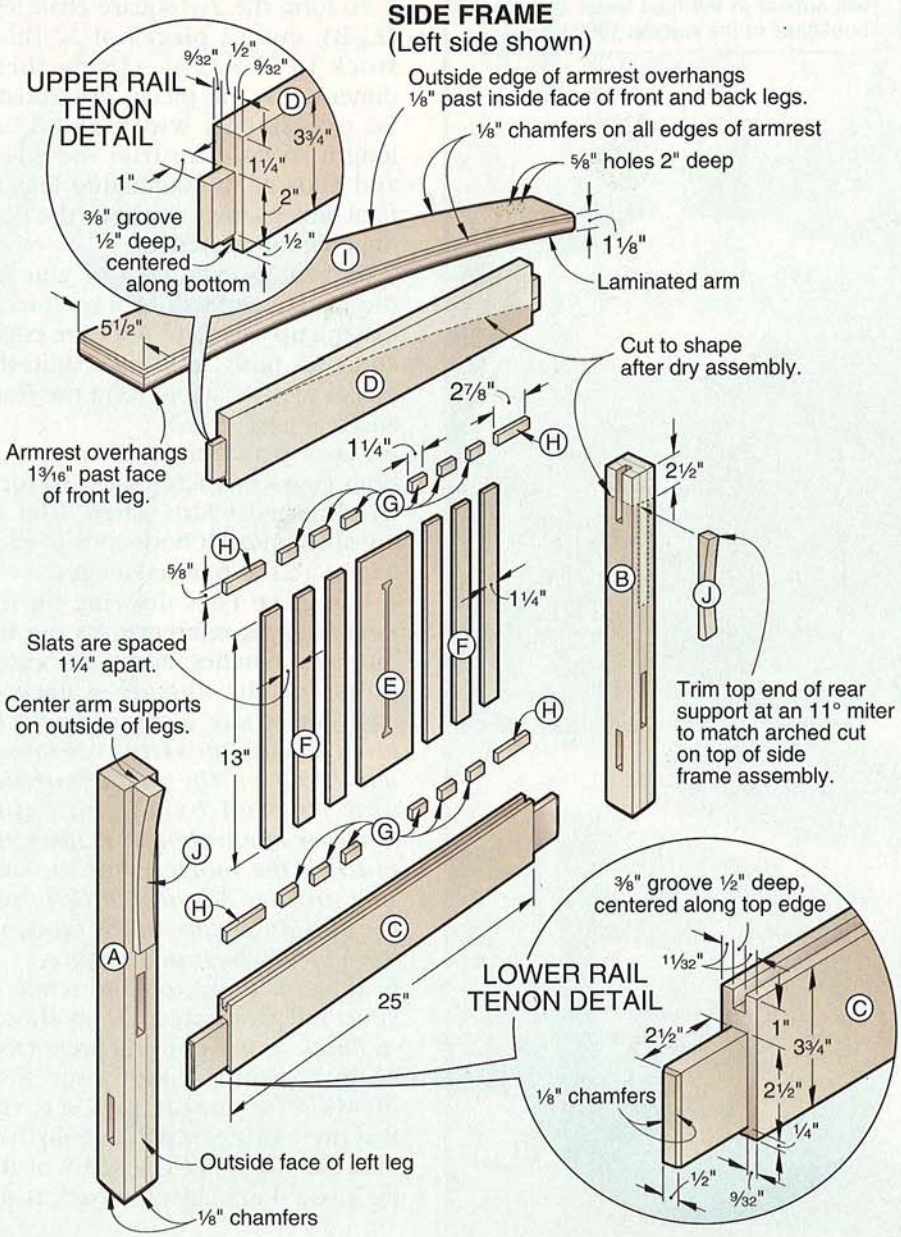
Morris Chair

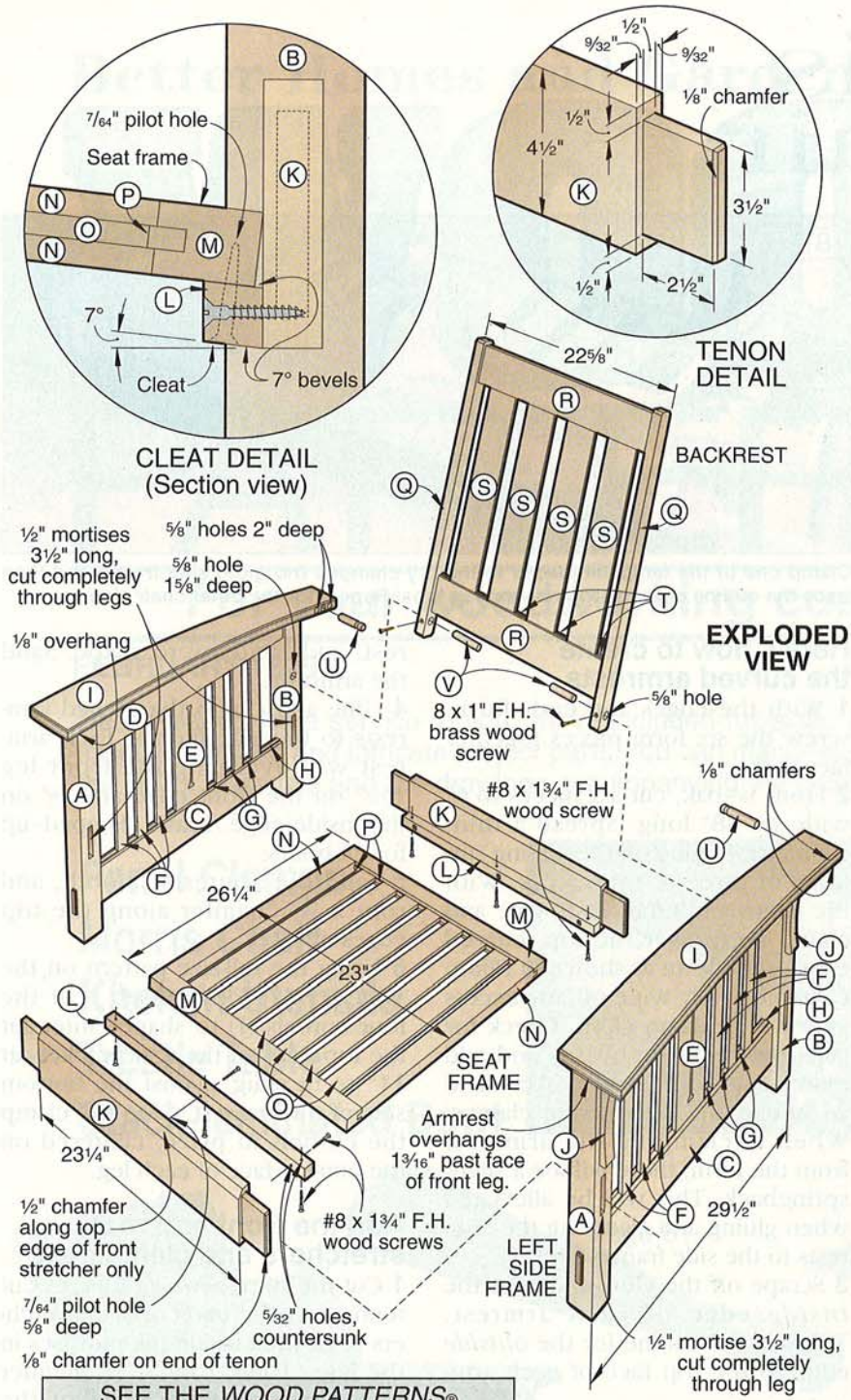
Instructions continue on next page



Using a fence on your drill-press table for alignment, remove the waste stock from the marked mortises on the laminated legs.







SEE THE *WOOD PATTERNS®* INSERT FOR FULL-SIZE PATTERNS AND PARTS VIEW DRAWINGS

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
SIDE FRAMES					
A* front legs	2¼"	2¼"	21¾"	LO	2
B* rear legs	2¼"	2¼"	21¾"	LO	2
C lower side rails	1 1/16"	3¾"	30"	O	2
D upper side rails	1 1/16"	3¾"	27"	O	2
E center side slats	⅜"	4¼"	13"	O	2
F side slats	⅜"	1¼"	13"	O	12
G* spacers	⅜"	⅝"	1¼"	O	24
H* spacers	⅜"	⅝"	2⅞"	O	8
I* armrests	1⅛"	5½"	36"	LO	2
J corbels	1 1/16"	1⅜"	8¾"	O	4
STRETCHERS AND CLEATS					
K stretchers	1 1/16"	4½"	28¼"	O	2
L cleats	1 1/16"	1 1/16"	23¼"	O	2
SEAT FRAME					
M ends	1 1/16"	1¾"	23"	O	2
N slats	1 1/16"	1¾"	23¾"	O	2
O slats	⅜"	1¾"	23¾"	O	7
P* spacers	⅜"	⅝"	29/32"	O	16
BACKREST					
Q stiles	1 1/16"	1⅝"	29"	O	2
R rails	1 1/16"	3½"	22"	O	2
S splats	⅜"	3¼"	20"	O	4
T* spacers	⅜"	⅝"	1½"	O	10
U back pins	⅝" dia.		3"	OD	2
V pins	⅝" dia.		3"	OD	2

*Cut parts marked with an * oversized. Trim to finished size according to the how-to instructions.

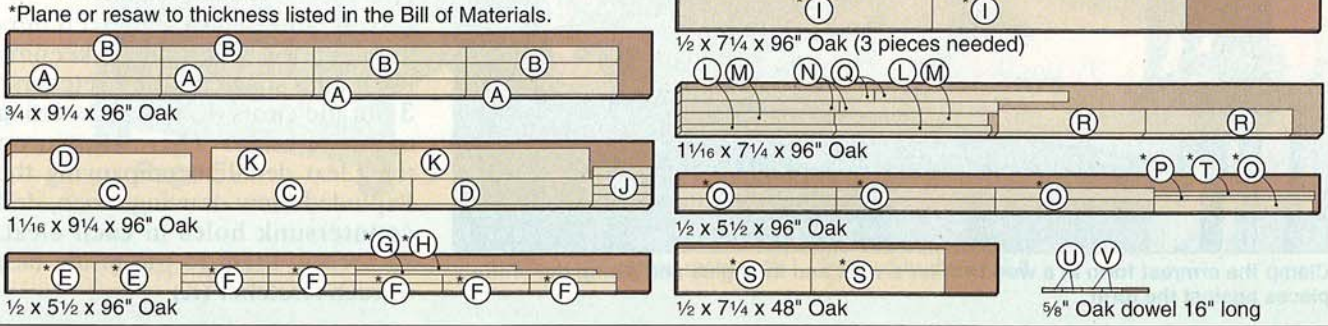
Materials Key: LO–laminated oak, O–oak, OD–oak dowel

Supplies: #8×1¾" flathead wood screws, #8×1" flathead brass wood screws, stain, finish.

Drill-press table plan. Plan JG–#1002, $9.95. WOOD PLANS, P.O. Box 9255, Des Moines, IA 50306 or call 800/572-9350 to order.

CUTTING DIAGRAM

*Plane or resaw to thickness listed in the Bill of Materials.


¾ x 9¼ x 96" Oak
1 1/16 x 9¼ x 96" Oak
½ x 5½ x 96" Oak
½ x 7¼ x 96" Oak (3 pieces needed)
1 1/16 x 7¼ x 96" Oak
½ x 5½ x 96" Oak
½ x 7¼ x 48" Oak
⅝" Oak dowel 16" long

Morris Chair

5 Cut the center slats (E) and narrower side slats (F) to size. Using the Parts View drawing on the *WOOD PATTERNS*® insert in the center of the magazine, transfer the cutout location to each center slat. Drill a blade start hole, and scrollsaw the openings to shape.

6 To form the spacers (G, H, P, T) cut six pieces of stock to ⅜" thick by ⅝" wide by 36" long. Then, crosscut the side frame spacers (G, H) to length from these strips.

7 To assemble the side frames, start by finding the center (from end-to-end) of each rail, and mark a centerline across the grain. Starting with the center slat (E) centered over the centerline on the bottom rail (C), work from the center out and add (no glue) the spacers (G, H) and slats (F). Add the top rail (D). Trim the spacers if necessary. Then, fit (again, no glue) the assembly into the leg mortises to check the joinery.

8 Using the Template/Form drawing on the pattern insert for reference, transfer the outline to ¾" particleboard, and cut six form pieces to shape. As shown in *Photo B*, use one of the pieces to transfer the curved cutline to each side frame.

9 Remove the clamp and separate the pieces. Bandsaw along the marked lines on the leg tops and top rail from each side frame. Sand the side frame pieces. Next, glue and clamp the two side frames together, checking for square.

Clamp one of the template pieces to the dry-clamped (no glue) side frame, and then trace the cutline onto the top rail and leg tops. Repeat for the other chair side.

Here's how to create the curved armrests

1 With the edges and ends flush, screw the six form pieces together face-to-face.

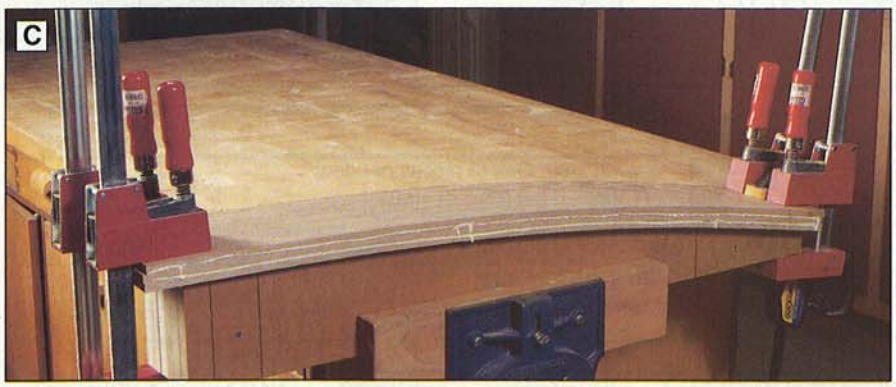
2 From ⅜" oak, cut six pieces to 6" wide by 38" long. Spread a thin, even coat of glue on the mating surfaces of three of the pieces. With the edges and ends flush, glue and clamp them over the top, curved edge of the form as shown in *Photo C*. Immediately wipe off any excess glue with a damp cloth. Check for gaps between the boards and add more clamps if necessary. Let stand 24 hours, and remove the clamps. When unclamping the armrests from the form, there will be a slight springback. This will be alleviated when gluing and clamping the armrests to the side frames later.

3 Scrape off the glue, and joint the *inside* edge of each armrest. Transfer the cutline for the *outside* edge to the top face of each armrest, and bandsaw to shape. Sand the armrests.

4 Glue and clamp the arched armrests to the side frames. Each armrest will overhang the front leg 1 3/16" on the front edge and ⅛" on the inside edge. Leave clamped-up for 24 hours.

5 Sand the armrests smooth, and rout a ⅛" chamfer along the top edges of each.

6 Using the full-size pattern on the *WOOD PATTERNS* insert, cut the four corbels (J) to shape. Miter-cut the top ends of the rear brackets at 11° to fit snug against the bottom side of the armrest. Glue and clamp the corbels in place, centered on the outside face of each leg.



Clamp the armrest form in a woodworker's vise, and then glue and clamp the armrest pieces against the form.

Add the front and rear stretchers and cleats next

1 Cut the stretchers (K) to size. Cut tenons on the ends of the stretchers to fit snug inside the mortises in the legs. Then, rout a ½" chamfer along the top front edge of the front stretcher. Next, cut or rout ⅛" chamfers on the ends of the tenons. See the Exploded View drawing for reference.

2 Glue and clamp the stretchers between the side frames, keeping the frames square to the stretchers.

3 Cut the cleats (L) to size, beveling opposite edges where shown on the Cleat detail accompanying the Exploded View drawing. Then, drill countersunk holes in each cleat, and screw them to the inside face of each stretcher (K).

Let's cut the pieces and assemble the seat frame

1 Cut the seat frame ends (M) and slats (N, O) to size.

2 Cut a ⅜" groove ½" deep centered along the inside edge of each end (M). Then, cut rabbets on the ends of the outside slats (N) to fit inside the grooves.

3 Cut the spacers (P) to length.

4 Assemble the seat frame (no glue), and check its fit between the stretchers (K). Then, glue and clamp the seat frame together, checking for square.

5 Sand the seat frame smooth, and set it in place. Using the previously drilled holes in the cleats (L) as guides, drill pilot holes into the bottom of the seat frame, and screw it in place.

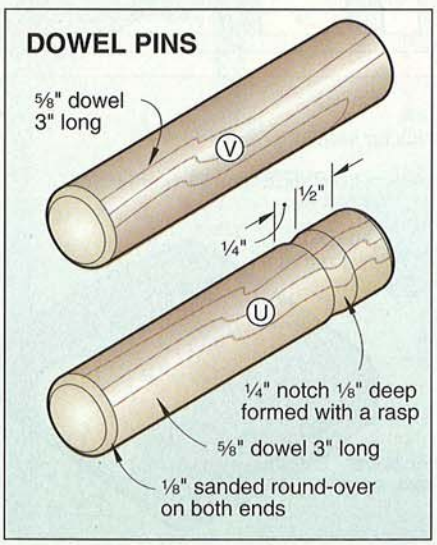
Now, let's construct the backrest

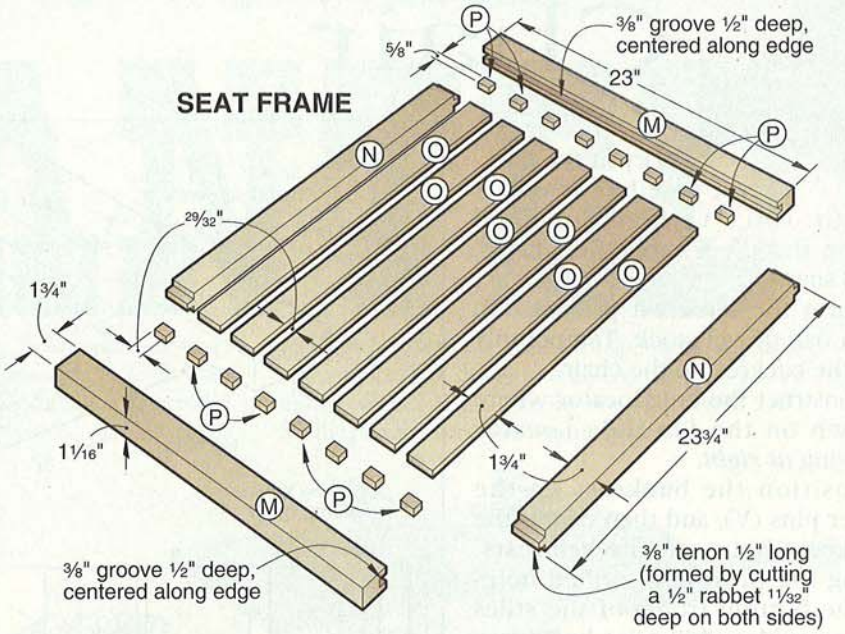
1 Cut the backrest stiles (Q), rails (R), splats (S), and spacers (T) to size.

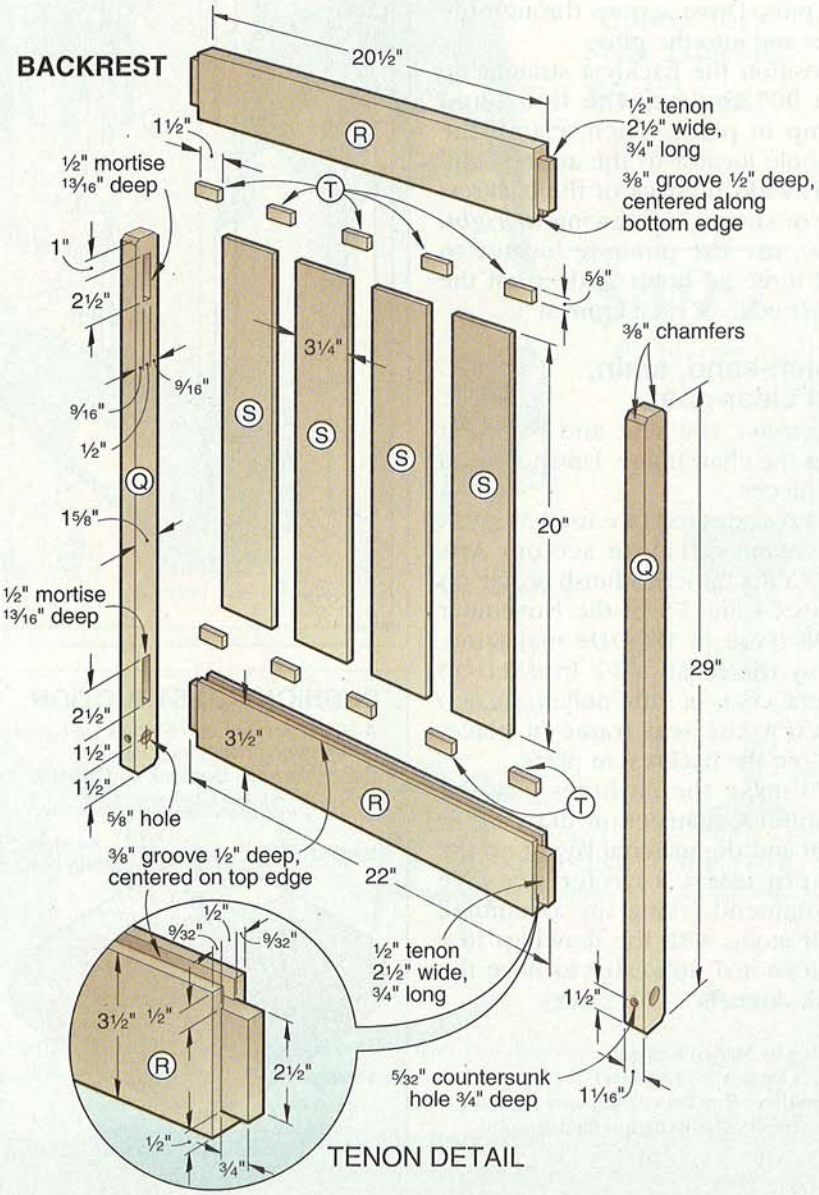
2 Using the Backrest drawing for reference, mark the mortise locations and hole centerpoints on each stile. Cut the mortises and drill the holes. Then, cut chamfers along the ends of each stile.

3 Cut tenons on the ends of the rails to fit into the stile mortises. Cut a ⅜" groove along the inside edge of each rail.

Continued







Morris Chair

4 Dry-fit the backrest together to check the fit. Once verified, glue and clamp the pieces together. Later, sand smooth.

5 Form the backrest pins (U, V) from oak dowel stock. Temporarily pin the backrest to the chair.

6 Construct the hole locator where shown on the Pin-Hole Locator drawing *at right*.

7 Position the backrest on the lower pins (V), and then center the backrest between the armrests. Using the previously drilled holes in the bottom fronts of the stiles (Q) as guides, drill pilot holes into the pins. Drive screws through the stiles and into the pins.

8 Position the backrest straight up at a 90° angle to the floor, and clamp in place. Then, clamp the pin-hole locator to the armrest and flush with the back of the backrest where shown in drawing *at right*. Now, use the pin-hole locator to drill three ⅝" holes 2" deep on the *inside* edge of each armrest.

Finish-sand, stain, and clear-coat

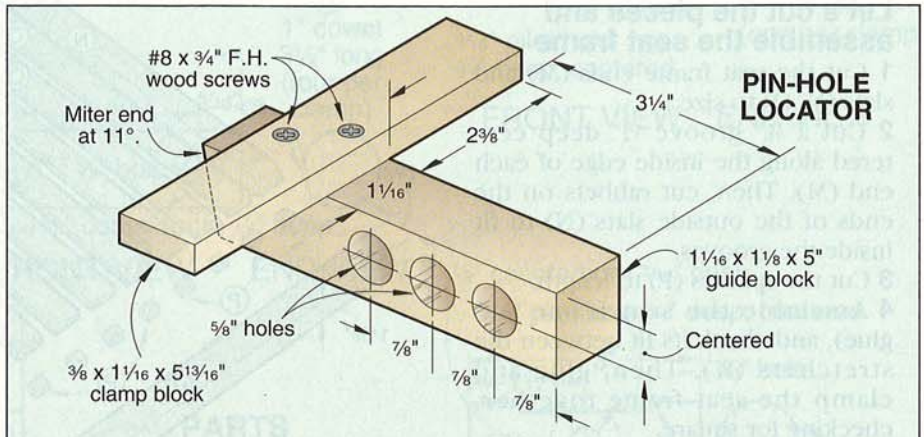
1 Remove the seat and backrest from the chair frame. Finish-sand all the pieces.

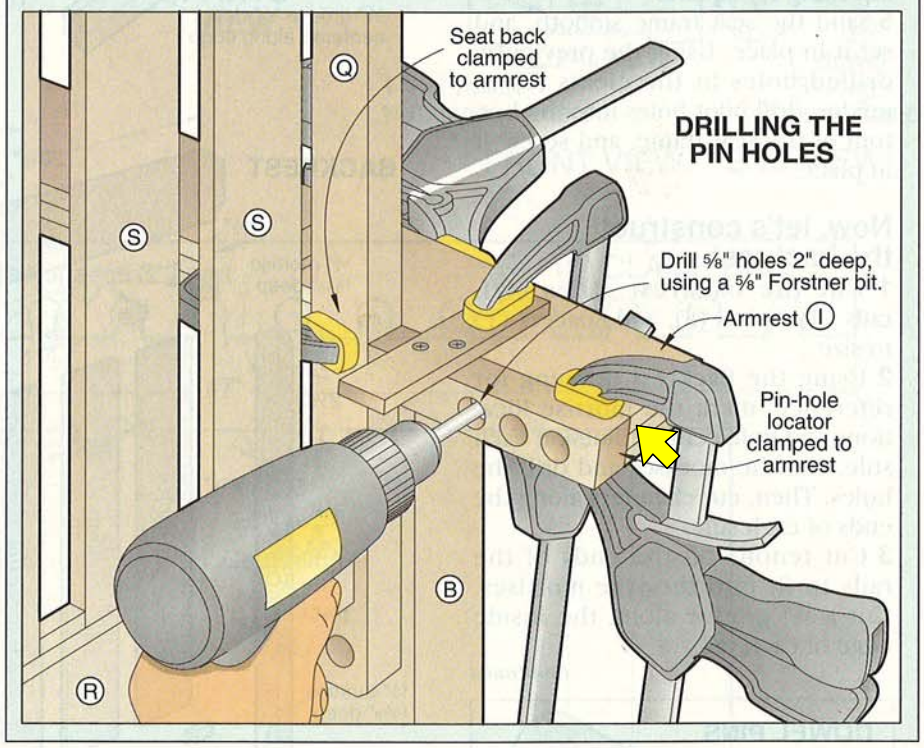
2 Stain as desired (we used Minwax Provincial #211), or see our Arts and Crafts fumeless finish article on pages 74 and 75 of the November 1998 issue of *WOOD®* magazine. Apply the finish. (We brushed on several coats of satin polyurethane.)

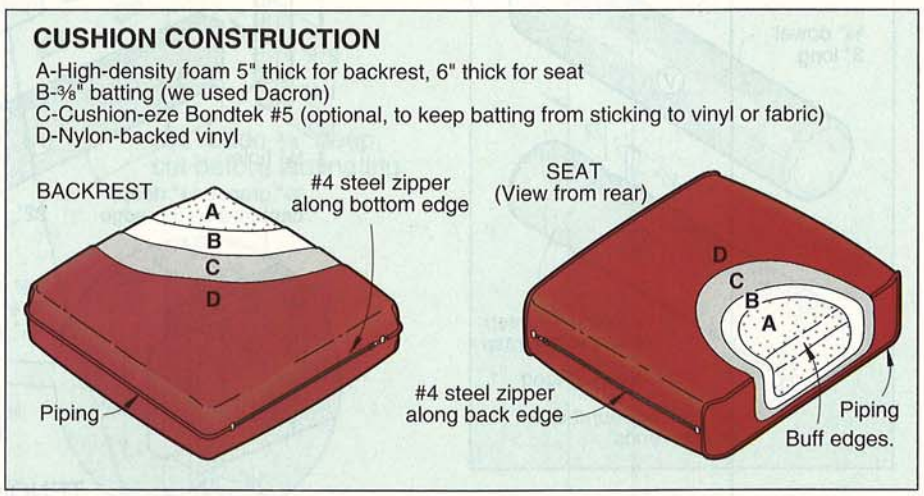
3 Screw the seat frame in place, and pin the backrest in place.

4 To make the cushions, see the Cushion Construction drawing *at right* and the material layout on the pattern insert for reference. We recommend taking the assembled chair along with the drawings to a professional upholster to have the work done.

Written by Marlen Kemmet
Project Design: Ted Scherrer
Illustrations: Kim Downing; Lorna Johnson
Photographs: Hetherington Photography







WANTED REWARD

Wanted for sawing, planing, drilling, molding and jointing in all 50 states. JET's band of woodworking tools was last seen in the company of the legendary contractor's style tablesaw. Anyone with information leading to the purchase of these tools is advised to follow the stampede to your local JET dealer to round up the tools you've always wanted. JET is offering rewards of up to $100 for the purchase of these notorious tools.

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JPM-13
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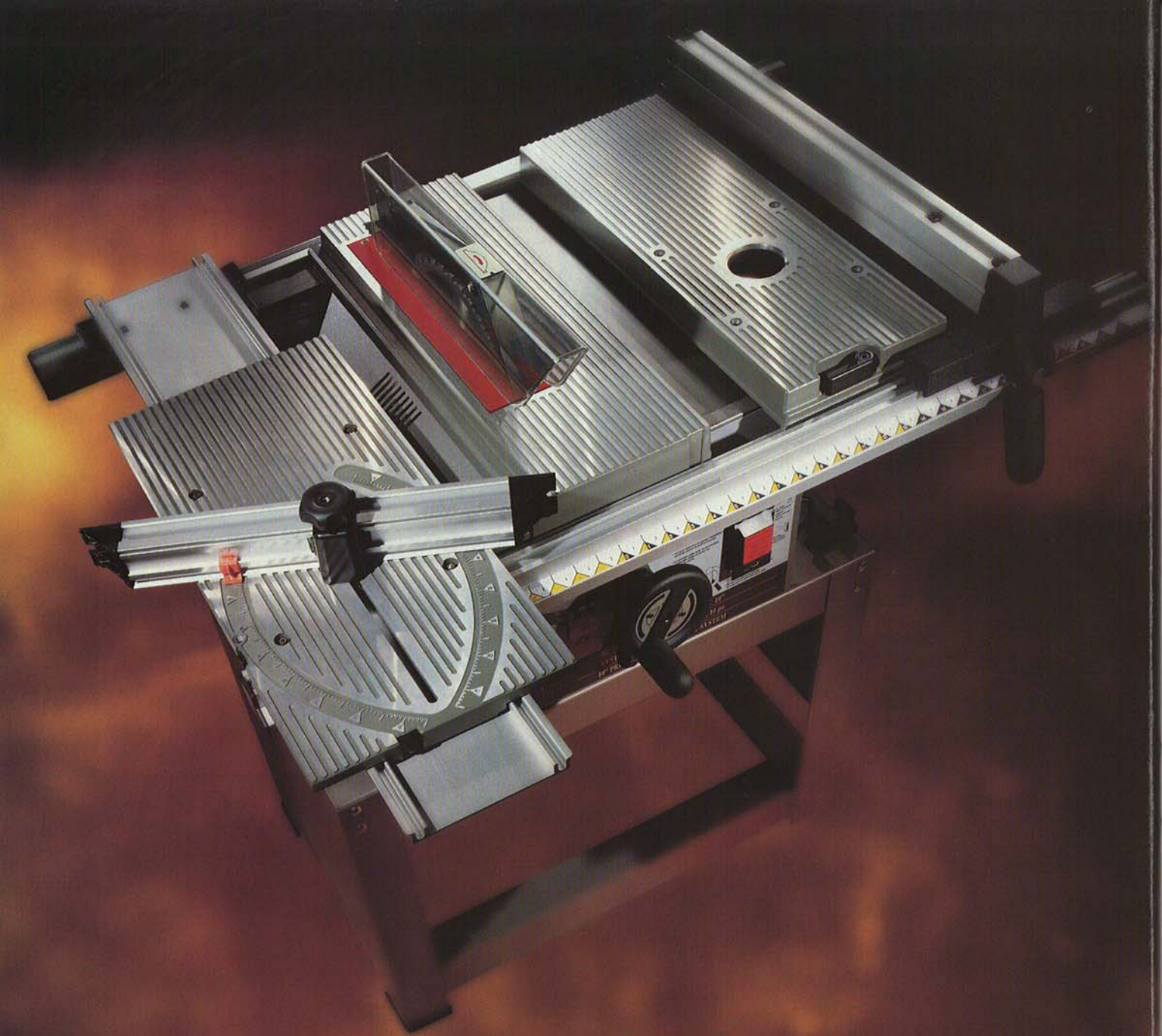
Amounts shown are manufacturer's rebates. Rebates also apply to 40th Anniversary Limited Edition tools.



CANCEL CABLE.

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RYOBI

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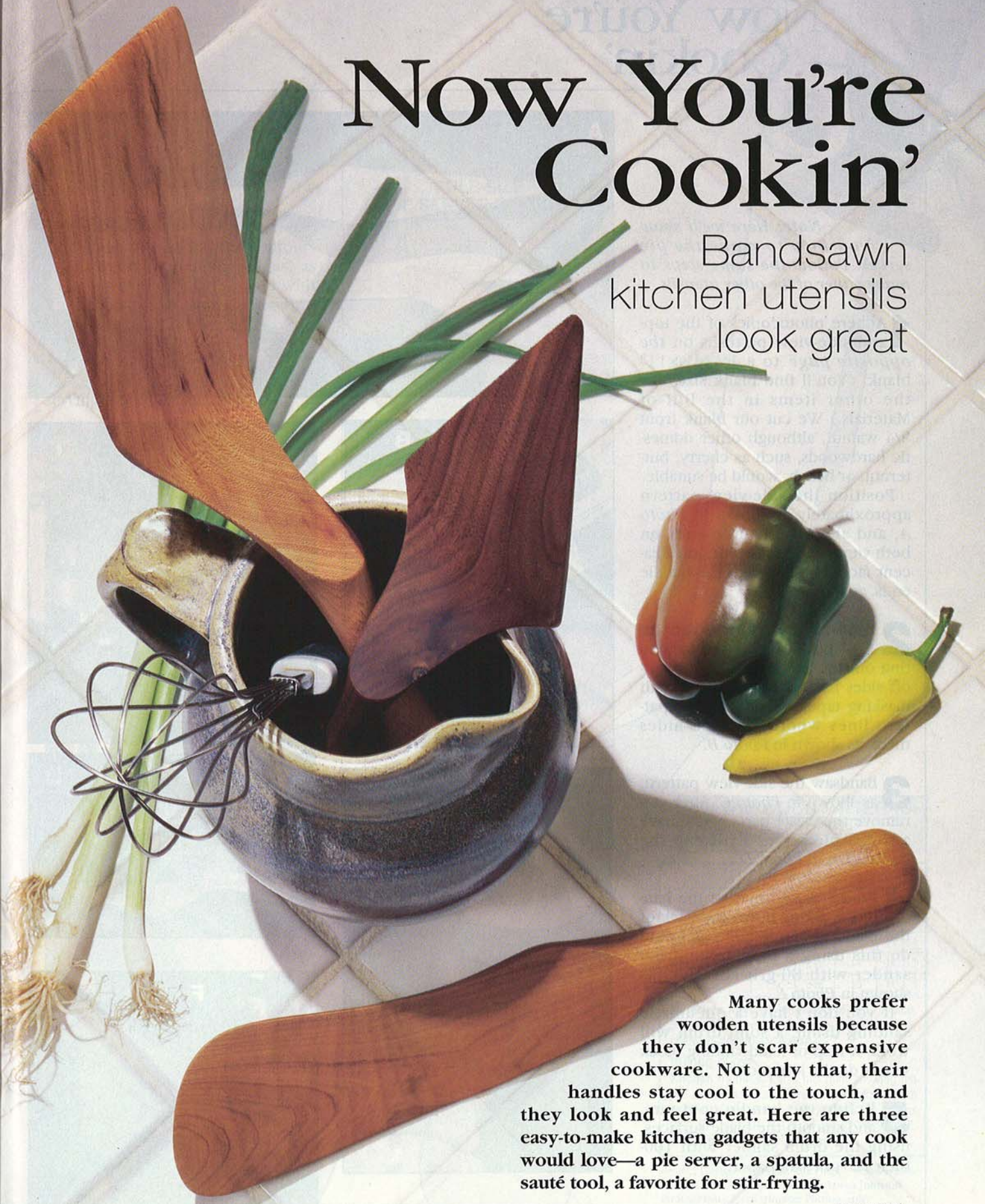
Now You're Cookin'

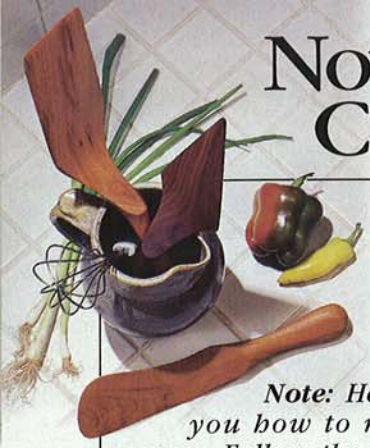
Bandsawn kitchen utensils look great



Many cooks prefer wooden utensils because they don't scar expensive cookware. Not only that, their handles stay cool to the touch, and they look and feel great. Here are three easy-to-make kitchen gadgets that any cook would love—a pie server, a spatula, and the sauté tool, a favorite for stir-frying.

Continued

Now You're Cookin'



***Note:** Here we'll show you how to make the pie server. Follow the same steps to make either of the other utensils.*

1 Adhere photocopies of the top- and side-view patterns on *the opposite page* to a 1¾×3¼×11" blank. (You'll find blank sizes for the other items in the Bill of Materials.) We cut our blank from 8/4 walnut, although other domestic hardwoods, such as cherry, butternut, or beech, would be suitable.

Position the side-view pattern approximately as shown in *Photo A*, and align the handle ends on both views. (We drew lines on adjacent faces to help align the handle ends, as shown.)

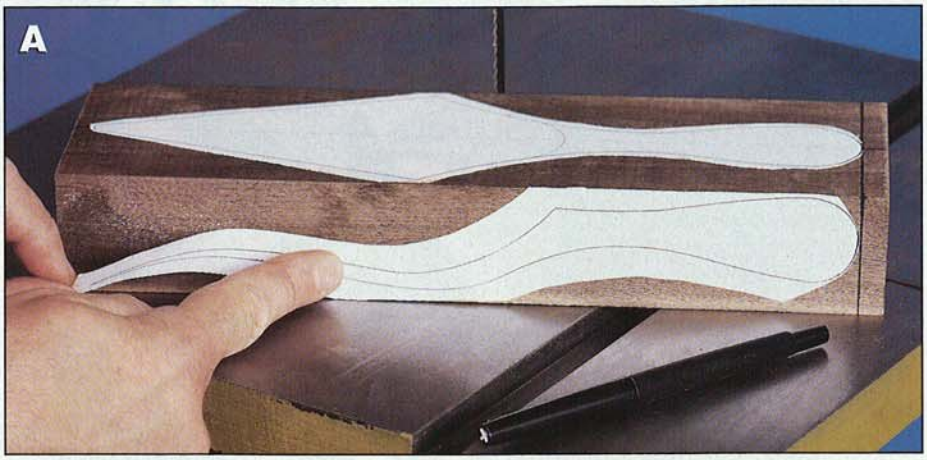
2 Bandsaw the top-view pattern. A ¼" blade works well for cutting out the utensils. Tape the cutoff sides back onto the blank with masking tape, and redraw the pattern lines where the tape hides them, as shown in *Photo B*.

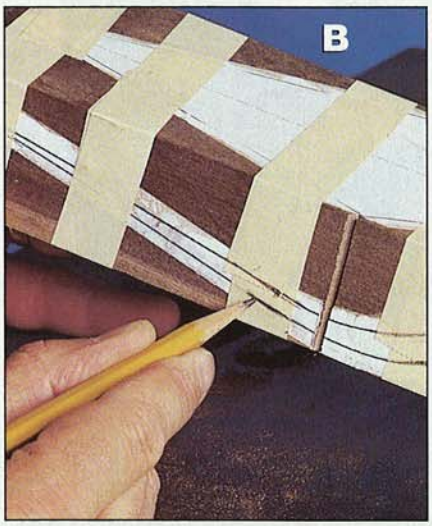
3 Bandsaw the side-view pattern, as shown in *Photo C*. After you remove the waste parts, you'll have a rough pie server similar to the one shown in *Photo D*.

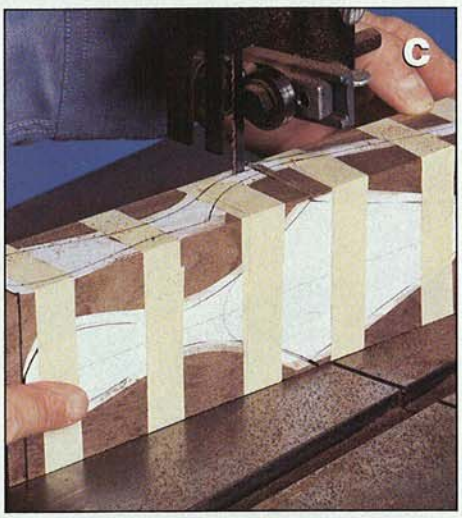
4 Round the corners of the handle, working down the back of the blade to the bend. You could do this using a pneumatic drum sander with 80-grit abrasive, as shown in *Photo E*.

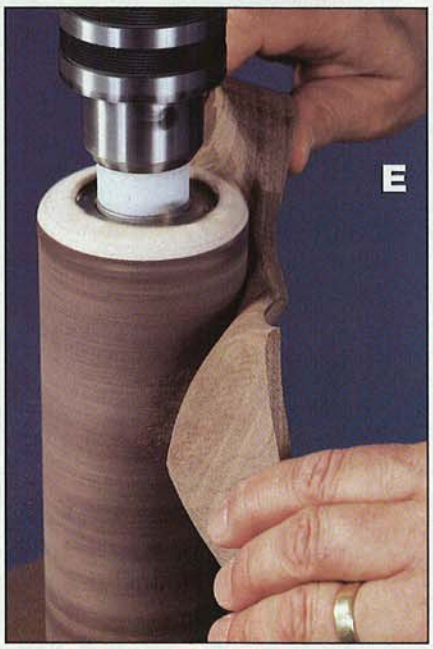
If you don't have a pneumatic sanding drum, a solid drum will work. A rasp or hand-sanding block would do the job, too.

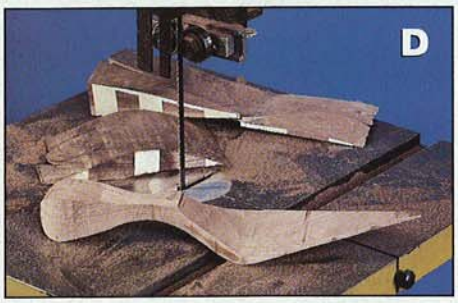
5 Refine the handle contours, and smooth the blade surfaces, using the drum sander with 100- then 120-grit sandpaper.







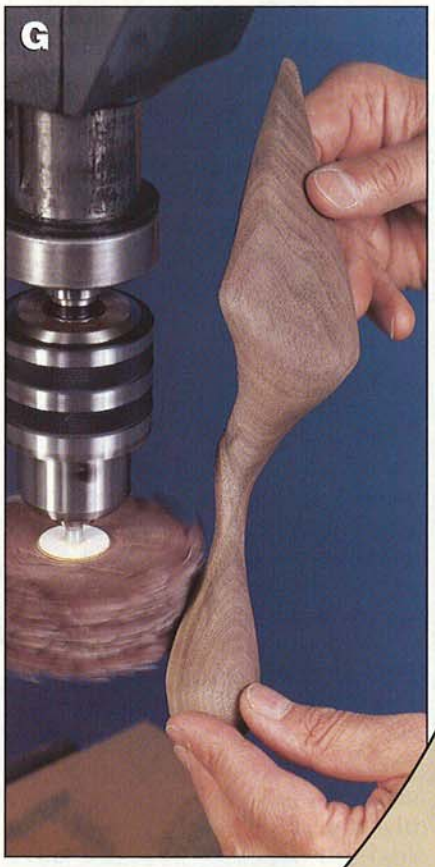




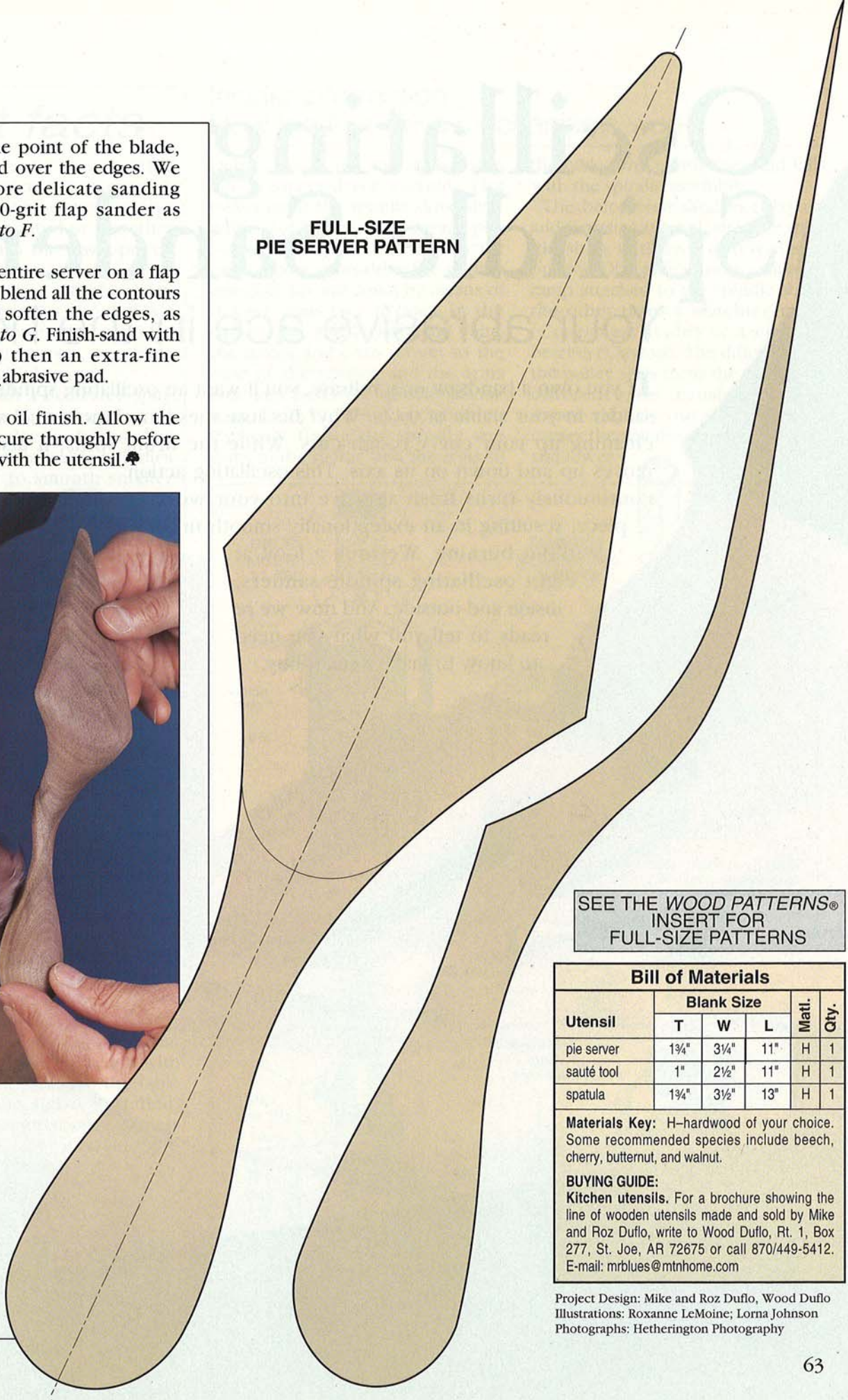
6 Round the point of the blade, and round over the edges. We did these more delicate sanding jobs on a 180-grit flap sander as shown in *Photo F.*

7 Sand the entire server on a flap sander to blend all the contours together and soften the edges, as shown in *Photo G.* Finish-sand with a fine (gray) then an extra-fine (white) nylon abrasive pad.

8 Apply an oil finish. Allow the finish to cure throughly before serving food with the utensil.



FULL-SIZE PIE SERVER PATTERN



SEE THE *WOOD PATTERNS®* INSERT FOR FULL-SIZE PATTERNS

Bill of Materials

Utensil	Blank Size T	W	L	Matl.	Qty.
pie server	1¾"	3¼"	11"	H	1
sauté tool	1"	2½"	11"	H	1
spatula	1¾"	3½"	13"	H	1

Materials Key: H–hardwood of your choice. Some recommended species include beech, cherry, butternut, and walnut.

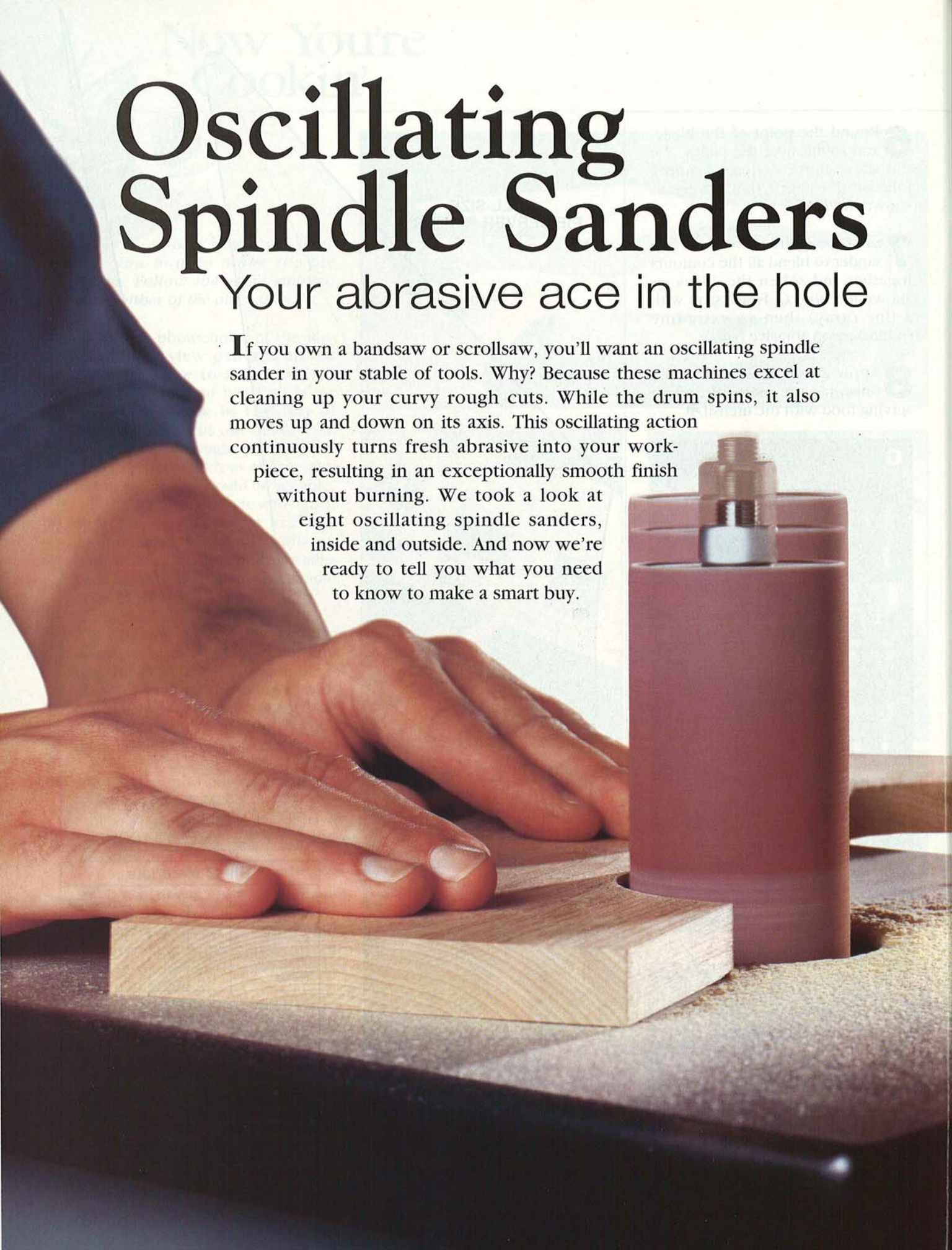
BUYING GUIDE:
Kitchen utensils. For a brochure showing the line of wooden utensils made and sold by Mike and Roz Duflo, write to Wood Duflo, Rt. 1, Box 277, St. Joe, AR 72675 or call 870/449-5412. E-mail: mrblues@mtnhome.com

Project Design: Mike and Roz Duflo, Wood Duflo
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Hetherington Photography

Oscillating Spindle Sanders

Your abrasive ace in the hole

If you own a bandsaw or scrollsaw, you'll want an oscillating spindle sander in your stable of tools. Why? Because these machines excel at cleaning up your curvy rough cuts. While the drum spins, it also moves up and down on its axis. This oscillating action continuously turns fresh abrasive into your workpiece, resulting in an exceptionally smooth finish without burning. We took a look at eight oscillating spindle sanders, inside and outside. And now we're ready to tell you what you need to know to make a smart buy.



Fast facts

- Higher-priced sanders offer more power and quicker sanding, but don't necessarily give you better control or smoother surfaces than the lower-priced models.
- You'll be happy with the shorter drum length (4½" or 5⅞") unless you have a real need for the 9" capacity (say, for stack-sanding multiple parts).
- Sanders with a dedicated spindle offer easier changing of drums and sleeves, but sanders with interchangeable spindles allow you to smooth smaller diameters—down to ¼".

Note: *Except for the number of drums and sleeves included, the Craftsman and Ryobi oscillating spindle sanders are essentially the same, so we'll refer to them as one unit.*

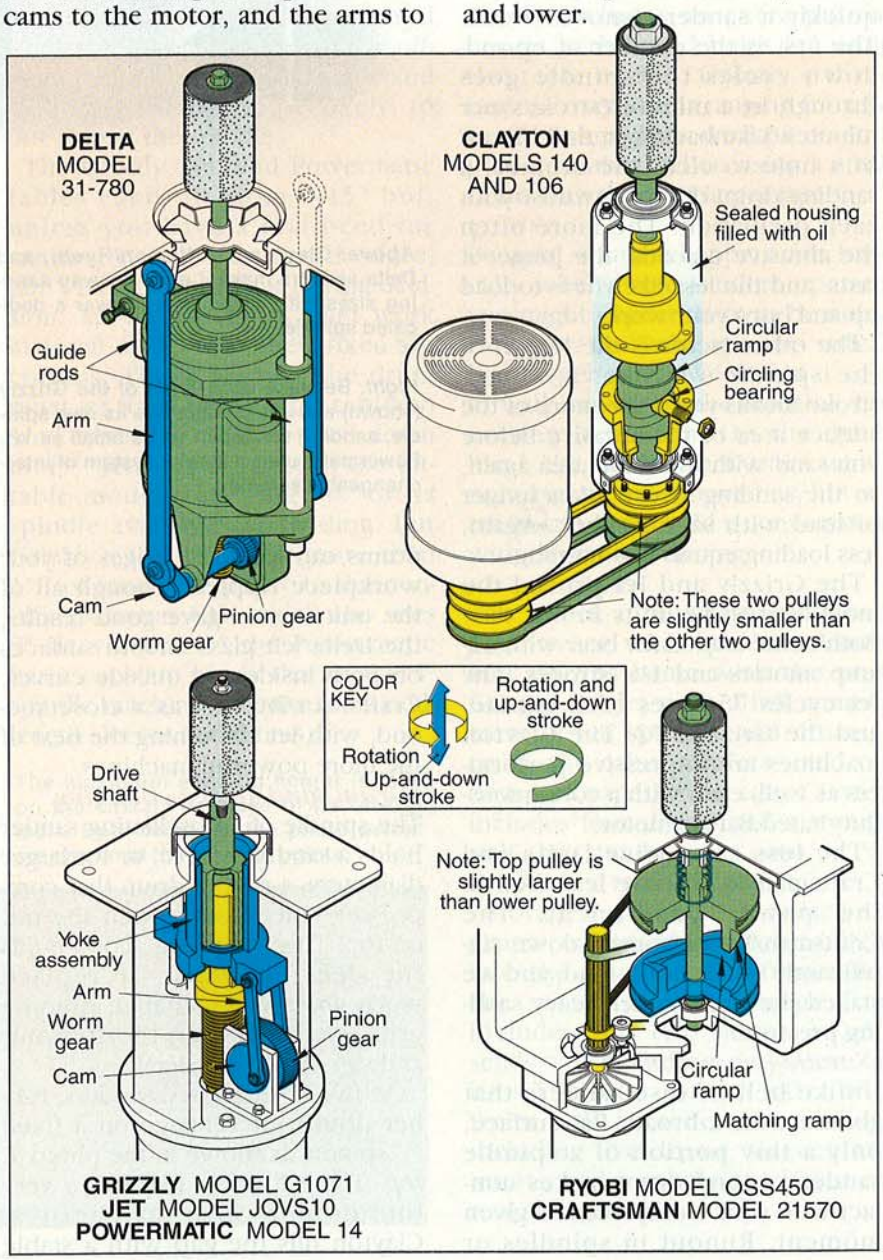
How we put these sanders to the test

To test power and aggressiveness, we timed how long it took each machine to sand ½" into 3"-thick oak, using 2"-diameter 50-grit sanding sleeves. We also sanded to a pencil line on random curves cut in ¾" oak plywood to test ease of control and sanding smoothness. During each of those tests, we observed the effectiveness of each tool's dust-collection mechanism. To test the spindle and drum runout, we checked each unit with a dial indicator 3" above the table with a sanding sleeve installed. Finally, we measured table flatness with a precision-ground straightedge and feeler gauges.

Insider information: How the four drive mechanisms work

Delta, Grizzly, Jet, and Powermatic use a direct-drive system. The motor turns the spindle drive shaft while also turning a worm-and-pinion gear attached to eccentric cams. Those cams drive the spindle assembly up and down by means of linkage arms (see *below*). In the Grizzly, Jet, and Powermatic units, the motor and cams mount to the base of the sander, and the arms raise and lower the spindle mechanism. Delta turns this operation on its head, fixing the spindle and cams to the motor, and the arms to the table. The motor rises and falls with the spindle assembly.

The belt-driven sanders (Clayton and Craftsman/Ryobi) turn the spindle shaft with two different-size pulleys. One pulley turns a circular ramp attached to the spindle shaft; the other turns a matching ramp (Craftsman/Ryobi) or a circling bearing (Clayton). The difference in the pulley sizes turns the devices at different rates, causing them to rotate slightly out of sync. This causes the spindle assembly to raise and lower.



Continued

Oscillating Spindle Sanders

Let's take a look at the four key performance areas

• Sanding aggressiveness

The most important element in determining a sander's power and aggressiveness is the mightiness of its motor. Induction motors are normally measured in horsepower, and universal motors in amperage draw. But, since we have both types of motors on the sanders in our test, we converted all of the power ratings to amperage so you could compare apples to apples. The higher-drawing sanders were the most aggressive in our test.

Two other factors impact how quickly a sander removes stock. The first is the number of up-and-down cycles the spindle goes through in a minute (strokes per minute). Like backing a drill bit out of a hole to clear the crumbs, a sanding drum dumps sawdust with each oscillation. The more often the abrasive unloads, the longer it lasts, and the less likely it is to load up and burn your work.

The other factor is the length of the spindle's stroke. A longer stroke means you'll use more of the surface area of the abrasive before you sand with the same area again, so the sanding sleeve takes longer to load with sanding dust. Again, less loading equals less burning.

The Grizzly and Jet proved the most aggressive units in our test. Both come loaded for bear with 12-amp. motors and 1½" strokes. The Jet cycles 75 times each minute, and the Grizzly, 72. The Clayton machines are impressive performers as well, each with a continuous-duty rated Baldor motor.

The less expensive Delta and Craftsman/Ryobi fare less well in the power department. The Craftsman/Ryobi bogged down significantly under heavy load, and we stalled the Delta under heavy sanding pressure.

• Sanding smoothness

Unlike belt or disc sanders that abrade with a broad, flat surface, only a tiny portion of a spindle sander's round drum makes contact with your workpiece at a given moment. Runout in spindles or drums can leave the edges of your workpiece rippled. Though all of the units tested gave good results, the Delta left glass-smooth surfaces on both inside and outside curves. Craftsman/Ryobi was a close second, with Jet smoothing the best of the more powerful machines.

Above: **Clayton, Craftsman/Ryobi, and Delta sanders make it easy to swap sanding sizes with drums that fit over a dedicated spindle.**

Right: **Because each drum of the Grizzly (shown) and Jet sanders has its own spindle, sanding diameters go as small as ¼". Powermatic uses a similar system of interchangeable spindles.**

• Drum- and sleeve-changing

The spindle of an oscillating sander holds a sanding sleeve, or for larger diameters, a rubber drum that compresses when you tighten the nut on top. This squashing action holds the sleeve in place. To replace worn abrasive or change sanding grits, simply loosen the top nut, and slip off the old sleeve.

On five of the tested sanders, rubber drums interchange on a fixed ½" spindle as shown in the photo at *top*. The ¾" sleeve requires a very thin drum to grip the abrasive. Clayton fills the gap with a stable steel drum; Craftsman/Ryobi and Delta use a rubber drum that distorts when using finer-grit sleeves, and under heavy sanding pressure. This leaves a ridge in the sleeve at the top of the sanding area.

Instead of a single, fixed spindle shaft, Grizzly, Jet, and Powermatic use several spindles that thread into the machine's drive shaft, as shown *above*. The Powermatic uses ¼", ½", and ⅜" spindles to hold its six sleeve sizes; Jet and Grizzly have an individual spindle for each sleeve-size. Those tiny spindles get into tighter areas for smoothing intricate scrollsaw work. (Machines with interchangeable drums are limited to the diameter of the spindle, usually ½".) But more spindles mean more chances for a bent or out-of-round shaft. And, because the smaller-diameter sleeves are not as common, they may be more diffi-

cult to find at a home center when you need more.

Interchangeable spindles also can be difficult to remove. Reaching beneath the tabletop with two wrenches, you risk skinning your knuckles when the shaft nut comes loose. Grizzly's 2" and larger drums left us only a narrow space for the wrench. We had to remove the drum before we could free the spindle from the machine. But, because all of the drums above 1½" use the same size spindle, for those sizes we found it easier to just change drums, much like the fixed-spindle sanders.

•Dust collection

As with any sander, these units quickly generate huge amounts of fine dust—the kind you can feel in your lungs almost before you can see it. That's why we consider the effectiveness of the dust-collecting arrangement a high priority. Nearly all of the machines' dust ports come sized for a standard 2½" shop vacuum hose (though the port of the Powermatic is odd-sized at 2"). Grizzly and Jet sanders come equipped with 4" dust ports.

Clayton and Craftsman/Ryobi performed best in their dust-grabbing duties. Sanders with tilting tables (Grizzly, Jet, and Powermatic) were about 25% less effective because of the larger openings in the inserts and under the sanding table. Delta uses a nifty onboard dust collector that blows about 75% of the sanding debris into a cloth bag. With a shop vacuum in place of the bag, its dust-catching rate increases to nearly 100%.

Other things to consider

•Sanding control

Following your rough cut, you want to sand up to the finish line without crossing it. The sanders in our test easily sanded up to a pencil line, but most required a lot of attention to keep from crossing it. Only the Delta allowed us to effortlessly split a pencil line with a 3" sanding drum, due to its excellent spindle runout and low vibration.

•Table

For sanding our 20×30" workpiece, all of the machines provided adequate support for sanding inside and outside curves. Clayton and Craftsman/Ryobi put the spindle off-center in the table, giving 14" and 12½" of tabletop, respectively, to one side of the spindle.

The Grizzly, Jet, and Powermatic tables each tilt from 0-45° but, unless you have a real need for sanding bevels on curved edges, don't factor it into your buying decision. Tilt-top machines can't work material as thick as their fixed-top cousins. That's because the drum must extend below the table to sand when the table is tilted down to 45°. Jet does the best of the tilt-table models, keeping 7⅛" of its spindle available for sanding. But Grizzly's table costs it more than 1½" of sanding capacity to the non-tilting Clayton 106, which also uses 9" sleeves. At 45° the Powermatic has a capacity nearly that of the 4" spindle machines, thanks to its odd-length sleeves and drums.

The maximum sanding height is less on the Grizzly because of its tilt-top table. Both drums in the photo *below* are shown at their lowest points.

Craftsman and Ryobi (shown) provide storage for drums, inserts, and a wrench, molded into the sander body.

•Inserts

The throat in each sander is slightly larger than its largest drum. For support around smaller drums, inserts fill in the gap. The Grizzly, Jet, and Powermatic inserts have oblong holes that allow them to be used with the table tilted. Powermatic nicely includes an extra pair of inserts with round holes for using the table at 90°. Grizzly's three inserts cover drums ranging from ¼" to 4", so up-close workpiece support is minimal when using a small drum with the next larger insert.

•Noise

Because so much happens mechanically when these sanders operate, you might expect them to be noisy. However, the Delta operates virtually whisper-quiet. We found it easy to walk away from the machine, forgetting it was on. On the other hand, the Craftsman/Ryobi's whiny universal motor annoyed us, but we could still easily hold a conversation with the motor running.

•Accessories

Take a look at the chart on the *next page* to see what spindles, drums, and sleeves come with the unit. Grizzly and Jet pack a full complement of ten spindles and drums—twice the other sanders—and onboard storage for all ten. Clayton includes four drums and a storage unit that stands on its own or can be attached to the machine.

Storage for Ryobi's standard six drums and inserts is molded right into the machine. (Craftsman has the same on-tool storage, but includes only two sleeves.) Delta sends only a ¾" drum and sleeve for its ½" spindle. For an extra $50, Delta sells an accessory package including five drums, sleeves, and inserts, and a couple of molded on-tool storage units.

Continued

Oscillating Spindle Sanders

If you asked us which sander to buy, we'd say...

...that depends: What do you plan to use your oscillating spindle sander for? The Craftsman 21570 and Ryobi OSS450 both deliver pretty good sanding results for not a lot of money. For the woodworker who needs to touch up a curve only occasionally, either of these machines would be fine. But, for about $40 more, the Delta 31-780 gave us the best control and sanding quality of any sander in the test. If you buy the Delta, consider spending another $50 for the accessory package that gives you a full range of drums and inserts.

If you need a machine that will withstand heavy everyday use, and money is no object, you can't go wrong with one of the Clayton sanders. Their stout motors and sealed bearing-housings offer durability to spare.

The Jet JOVS10 sanded smoother than the other stationary sanders, and has nice touches like cast-iron inserts and a pair of spindle-changing wrenches. At $899, these niceties come at a price.

However, if you're looking for a heavy-duty machine and watching your budget, our top choice is the Grizzly G1071. For sanding performance about equal to the Clayton and Jet, the Grizzly offers a price tag hundreds less.

Mixed-breed units combine belts and spindles

Belt sanders sand flat and oscillating spindle sanders sand round, and never the two shall meet, right? Not any more, thanks to a couple of hybrids that combine qualities of both: Grizzly's Vertical/Horizontal Oscillating Sander (*below left*) and Ridgid's Oscillating Edge-Belt Sander (*below right*).

For aggressive flat-edge sanding, both units oscillate a 4×24" abrasive belt. Remove the belt assembly, slip a sleeve over the drive drum, and the Ridgid becomes an oscillating spindle sander; the Grizzly, a non-oscillating drum sander.

Ridgid's oscillating shaft accepts standard 4½" drums and sleeves from ½" to 2" in diameter. Sanding quality and control equaled the Delta, with a bushel more power.

As a drum sander, the Grizzly lacks the oscillating motion necessary to keep the abrasive from loading up. And the fixed 1½" drum limits sanding to that diameter.

With the belt assembly in place, both sanders allow sanding curves on the drums. Go lightly on the Ridgid though; such sanding tended to mistrack the belt in our tests.

Both sanders are affordable. The Grizzly MS-240 runs $180, with the Ridgid priced at $239. (Watch for a more detailed review of the Ridgid sander in a future issue.)

MANUFACTURER/ IMPORTER	MODEL (1)	TYPE (2)	MOTOR: AMPERAGE DRAW 110V (3)	MOTOR: DRIVE TYPE (4)	SPEED: SPINDLE (RPM)	SPEED: STROKES PER MINUTE (NO LOAD)	SPEED: SPINDLE DESIGN (5)
CLAYTON	140*	I	7.6	B	1700	60	FS
	106**	I	7.6	B	1700	60	FS
CRAFTSMAN	21570	U	3.5	B	2000	58	FS
DELTA	31-780	I	3.5	D	1725	60	FS
GRIZZLY	G1071	I	12	D	1720	72	IS
JET	JOVS10	I	12	D	1725	75	IS
POWERMATIC	14	I	9	D	1720	30	IS
RYOBI	OSS450	U	3.5	B	2000	58	FS

NOTES:

1. (*) Also available with 9" spindle and drums as model 146 for $712.
   (**) Also available with 4½" spindle and drums as model 100 for $816.
2. (I) Induction
   (U) Universal, permanent magnet
3. Typically, induction motors are rated in horsepower. However, in our tests we found amperage draw a more reliable measurement of power.
4. (D) Direct drive
   (B) Belt drive
5. (FS) Fixed spindle with interchangeable drums
   (IS) Interchangeable spindles for each drum size

1999 WOOD MAGAZINE EDITORS' CHOICE TOP VALUE
Delta 31-780
1999 WOOD MAGAZINE EDITORS' CHOICE TOP TOOL
Clayton 106
Jet JOVS10
Clayton 140
Powermatic 14
1999 WOOD MAGAZINE EDITORS' CHOICE TOP TOOL
1999 WOOD MAGAZINE EDITORS' CHOICE TOP VALUE
Grizzly G1071

THE QUICK-READ ON EIGHT OSCILLATING SPINDLE SANDERS

	SPINDLE STROKE (INCHES)	DUST COLLECTION INLET SIZE (INCHES)	MINIMUM SANDING DIAMETER (INCHES)	MAXIMUM SANDING THICKNESS (INCHES)	DRUMS AND SLEEVES: LENGTH (INCHES) (1)	DRUMS AND SLEEVES: STANDARD SIZES (DIAMETER-INCHES)	DRUMS AND SLEEVES: OPTIONAL SIZES (DIAMETER-INCHES)	DRUMS AND SLEEVES: STORAGE (YES, NO)	TABLE: SIZE (INCHES)	TABLE: MATERIAL (6)	TABLE: HEIGHT TO TABLETOP (INCHES)	TABLE: TILT (YES, NO)	PERFORMANCE RATINGS (7): POWER (8)	AGGRESSIVENESS (9)	SANDING SMOOTHNESS (10)	EASE OF CHANGING DRUMS	PORTABILITY	NOISE LEVEL	VIBRATION	DUST COLLECTION (11)	SPINDLE RUNOUT (12)	DRUM RUNOUT	WARRANTY	COUNTRY OF ASSEMBLY (13)	WEIGHT (POUNDS)	SELLING PRICE (14)	COMMENTS
	3/4	2 1/4	1/2	3 13/16	4 1/2*	1/2, 3/4, 2, 3	1, 1 1/4, 1 1/2, 2 1/4, 2 1/2	Y	13 3/8 x 20 1/2	GS	14	N	E	G	G	E	F	G	G	E	E	G	1 yr	USA	80	$638	Professional, continuous-duty sander. Fast stock removal. Also available with 9" spindle.
	3/4	2 1/4	3/4	8 1/8	9**	3/4, 1, 2, 3	1 1/4, 1 1/2, 2 1/4, 2 1/2	Y	16 5/8 x 20 1/2	GS	35 1/4	N	E	G	G	E	P	G	G	E	G	G	1 yr	USA	120	879	Same as Clayton 140, but with floor stand and 9" spindle. Also available with 4 1/2" spindle.
	5/8	2 1/4	1/2	3 11/16	4 1/2	1/2, 1	3/4, 1 1/2, 2, 3	Y	14 x 20	MDF	13 3/4	N	G	P	E	E	E	F	E	E	E	E	1 yr	MEX	26	159	Nearly identical to Ryobi unit in appearance and performance.
	7/8	1 1/2	1/2	3 5/16	4 1/2	3/4	1/2, 1, 1 1/2, 2, 3	Y	18 1/2 (diameter)	GCI	12	N	F	P	E	E	G	E	E	G	E	E	2 yr	TAI	45	195	Smoothest sanding results. The best value in benchtop sanders.
	1 1/2	4	1/4	6 1/2	9	1/4, 3/8, 1/2, 5/8, 3/4, 1, 1 1/2, 2, 3, 4	--	Y	25 1/4 x 25 1/4	GCI	35 3/4	Y	E	E	G	P	P	G	E	F	G	F	1 yr	TAI	287	475*	Lots of power, with fastest sanding in test. Includes 1/4" through 4" drums. Spindle changes difficult.
	1 1/2	4	1/4	7 1/8	9	1/4, 3/8, 1/2, 5/8, 3/4, 1, 1 1/2, 2, 3, 4	--	Y	25 1/4 x 25 1/4	GCI	38	Y	E	E	E	G	P	G	E	F	E	E	2 yr	TAI	298	899	Best spindle/drum runout of sanders with interchangeable spindles. Cast-iron inserts.
	1	2	1/4	3 1/4	5 7/8	1/4, 1/2, 5/8, 1 1/2, 2	3	N	14 1/2 x 14 1/2	GCI	18 1/2	Y	E	F	G	G	F	G	G	F	G	F	1 yr	TAI	77	299	Includes 1/4" through 2" drums. Poor dust collection.
	5/8	2 1/4	1/2	3 11/16	4 1/2	1/2, 3/4, 1, 1 1/2, 2, 3	--	Y	14 x 20	MDF	13 5/8	N	G	P	E	E	E	F	E	E	E	E	2 yr	MEX	26	169	Smooth sanding. Appropriate for light-duty use. Great value. Noisy, universal brush-type motor.

6. (GCI) Ground cast iron
(GS) Ground steel
(MDF) Melamine-coated medium-density fiberboard

7. E Excellent
G Good
F Fair
P Poor

8. E No noticeable change in RPM under load.
G RPM drop under heavy load.
F Motor can be stopped under load.

9. Time required to sand 1/2" into 3"-thick solid oak
E 18-20 seconds
G 20-25 seconds
F 25-40 seconds
P 40-45 seconds

10. E Consistent, smooth edge. No ripples.
G Attention to feed required to minimize ripples.

11. E Collects 95-100% of dust.
G Collects 70-75% of dust.
F Collects 60-65% of dust.

12. Measured 3" above tabletop.
E Smooth sanding of workpiece.
G Slight hammering of workpiece.

13. (USA) United States of America
(MEX) Mexico
(TAI) Taiwan

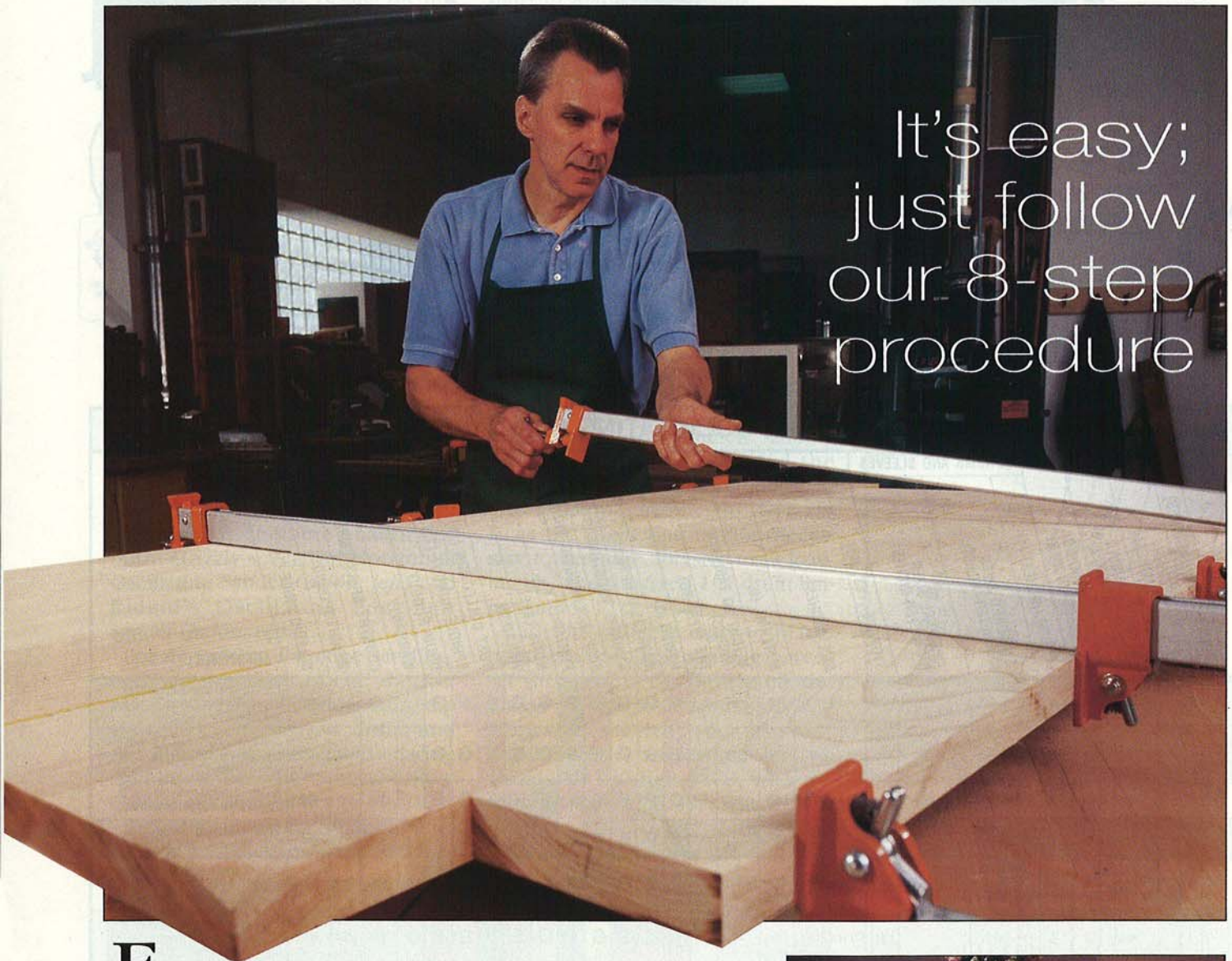
14. Prices current at time of article's production and may change.
(*) Shipping charges additional

Where to call for more information:

Clayton 800/971-5050	Grizzly 800/523-4777
Delta 800/438-2486	Powermatic 800/248-1044
Jet 800/274-6848	Ryobi/Craftsman 800/525-2579

Written by Dave Campbell
Technical Consultant: Bob McFarlin
Photographs: Baldwin Photography
Illustration: Kim Downing

How to Build a Flat Solid-Wood Tabletop



Every now and then I'm thoroughly impressed. Such was the case when I saw the flat-as-glass top on the country table that Assistant Design Editor/Project Builder Jan Svec constructed for issue #89 (see photo at *right*). And, I was really blown away when Jan told me he didn't do a bit of belt sanding or use any specialized clamps to achieve such stunning results. I knew right then that we had to share this process with you.

So, Jan and I recently got together in the shop to build a similar tabletop. Here, step-by-step, is how to do it.

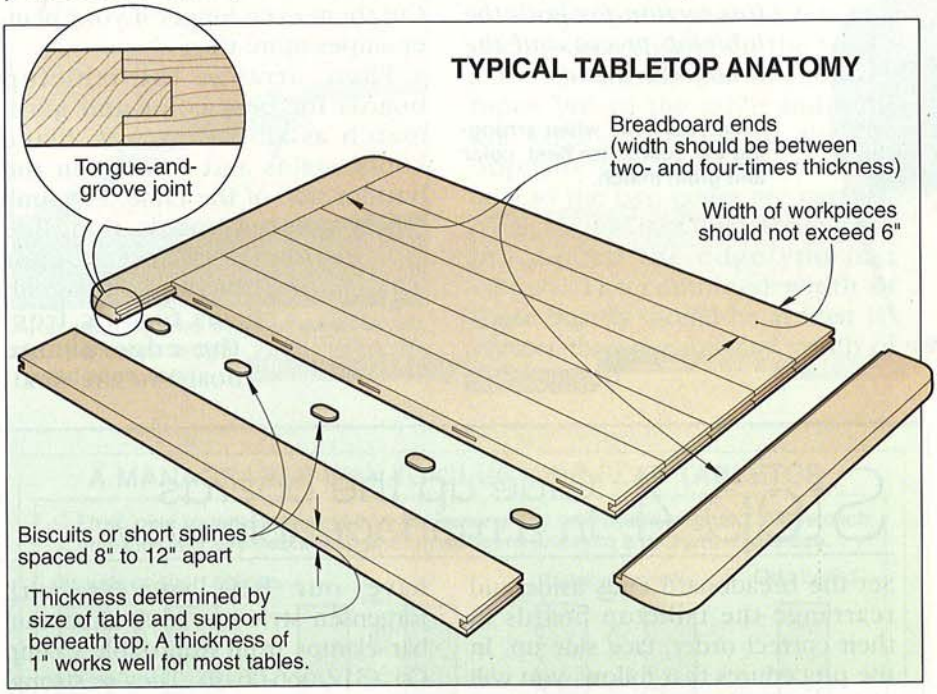
Bill Krier
Assistant Managing Editor

Step 1 Plan ahead for success later

In this article we'll build a 36×60" tabletop—typical for a kitchen table. For this, and nearly any other table, a 1"-thick hardwood top looks visually appealing and holds up well. But, you may want to make your tabletop only ¾" thick if it sits atop a smaller base, such as an end table. On the other hand, a massive table, say one in a conference room, may look better with a top as thick as 1½". When in doubt, err on the side of making your tabletop thicker than might be necessary.

Next, decide whether you want to place breadboard ends like the ones at *right* on your tabletop. These pieces serve two purposes. First, they improve the appearance of the top by hiding end grain. And, they help hold the top flat in the future while allowing it to expand and contract across its width as humidity levels change.

We'll show you how to attach the breadboard ends using a tongue-and-groove joint, although a sliding dovetail works well, too. You can hide a tongue-and-groove joint or leave it exposed as shown in the drawing and in the small photo on the *previous page*. (In this article we'll show you how to take either route.)


TYPICAL TABLETOP ANATOMY
Tongue-and-groove joint
Breadboard ends (width should be between two- and four-times thickness)
Width of workpieces should not exceed 6"
Biscuits or short splines spaced 8" to 12" apart
Thickness determined by size of table and support beneath top. A thickness of 1" works well for most tables.

Step 2 Choose the best boards you can find

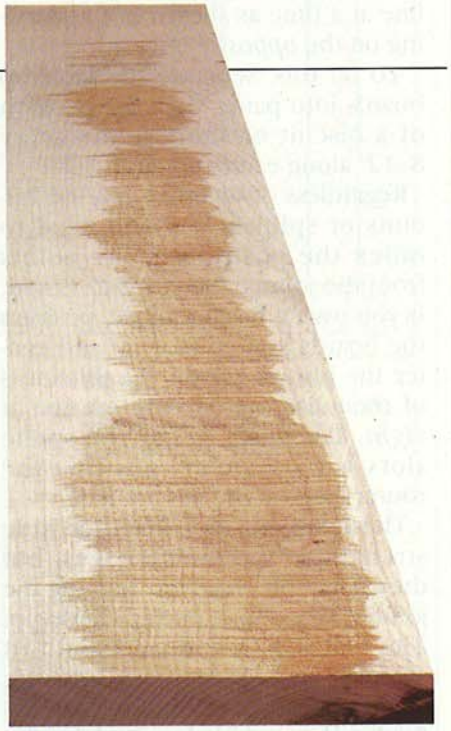
The most crucial part in building a flat tabletop that stays that way is selecting flat boards. Of course, truly flat boards are few and far between, so you'll need to flatten them in your workshop. And that means removing some stock from their faces with a jointer and planer.

Because of these machining steps, you will need to buy rough-sawn or skip-planed 5/4 (five-quarter) stock in order to make a 1"-thick finished top. Skip-planed stock, available from many specialty hardwood dealers, is just partially planed as shown at *right*. (Our skip-planed 5/4 hard maple was just a hair shy of 1¼" thick.) Five-quarter boards completely planed on both sides will be only about 1⅛" thick when you buy them, leaving you little extra thickness for removing warp.

As you select boards, keep in mind that you will have to remove enough stock to flatten them. So, if you start with boards 1¼" thick, they can have no more than ¼" of warp over the length of your tabletop. Also try to get boards with the same color and grain structure.

To make up for waste from edge-jointing and ripping, plan on buying 15-20 percent more total width than you'll need for the finished workpieces. We suggest you make your tabletop from pieces between 4" and 6" wide. Why? In the next section we will joint the workpiece faces on a 6⅛" jointer, and plane the boards in glued-up pairs in a 12½" thickness planer.

You can work with wider boards if you joint them by hand or with an 8" jointer, and have a planer with a cutterhead wider than 12½". But, wide stock is more likely than narrow stock to warp significantly after you assemble the top.



Skip-planed boards such as this one give you extra material to remove when face-jointing, but still show the grain.

Continued

Solid-Wood Tabletop

Step 3 Prepare the workpieces for assembly

Take your time when arranging the boards for best color and grain match.

Note: *Follow the machining procedures in this section for both the tabletop pieces and the breadboard ends.*

Crosscut the boards at least 4" longer than their finished length. Cut them even longer if your planer snipes more than 2".

Then, arrange the tabletop boards for best color and grain match as shown at *left*. Place knots, stains and defects on the bottom side of the table. Put similarly colored boards alongside each other, and stagger them slightly so the grain seems to flow from the edge of one board to the next. If the color and grain is uniform from board to board, try to lay out the boards symmetrically according to width, with a single wider board in the middle, or two wider boards on the sides.

Take your time and try lots of combinations. Arranging the boards is a bit of an art, but patience and effort now will reap benefits down the road. After you're pleased with the arrangement, mark the ends of the boards with numbers to keep track of their order and face (up) sides.

Step 4 Glue up the boards in a manageable way

Set the breadboard ends aside and rearrange the tabletop boards in their correct order, face side up. In the procedures that follow, you will glue up the boards in pairs, then glue up those pairs, and so on, never clamping more than one joint line at a time as shown in the drawing on the *opposite page*.

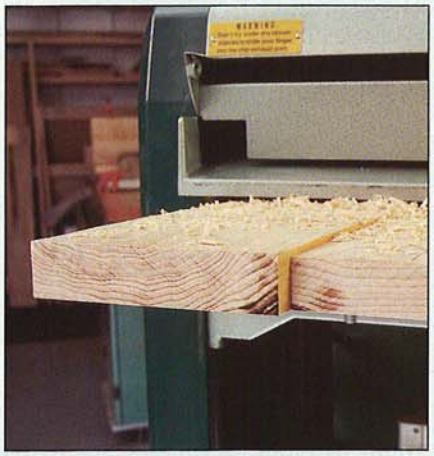
To do this, separate the tabletop boards into pairs. Mark the position of a biscuit or short spline every 8–12" along each joint line.

Regardless of whether you use biscuits or splines, you will need to index the position of their slots from the jointed face of each board. If you own a biscuit joiner, position the boards jointed face up and center the biscuit cut on the thickness of the adjoining edges as shown at *right*. Likewise, to cut the spline slots with a router, position the router base on the jointed face.

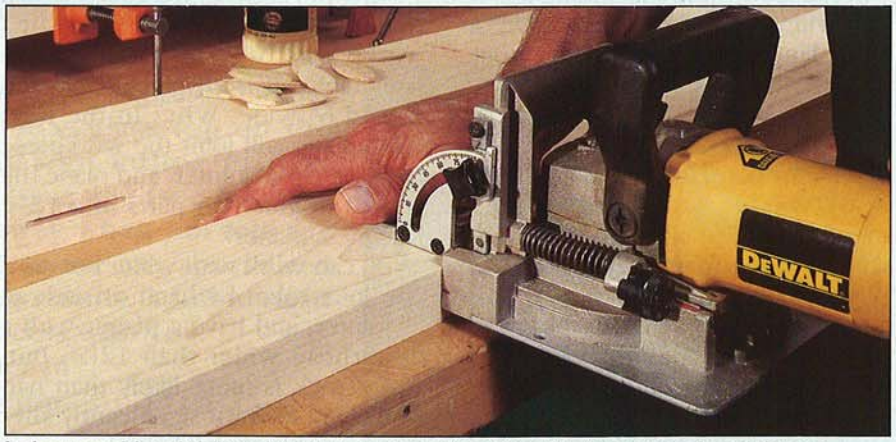
These biscuits or splines add little strength to the joined edges, but they help you greatly in aligning the jointed faces flush during clamp-up. The biscuits or splines should fit snugly, so we avoid using long splines because they make it too difficult to bring the edges together.

Although you can use any bar or pipe clamp to join the pairs, we have our best success with Jorgensen style no. 3500 aluminum bar clamps from Adjustable Clamp Co. (312/666-0640). They're strong, light in weight, and have square tubular bodies. The aluminum does not leave stain marks at glue lines, and you can firmly press the boards down onto the square top surface of the tube.

To clamp the boards, apply yellow woodworker's glue to the mating edges, insert the biscuits or splines, join them together, and place the assembly, jointed-face-down, on top of clamps spaced about 2' apart. Lightly tighten the clamps and check the jointed faces for flush



Place the jointed faces of the glued-up pairs down on your planer bed. The planer will even up their thicknesses.



Index your biscuit joiner (shown) or slot cutter from the face side of each board.

A flat table that requires little sanding begins with flat, face-jointed boards.

After jointing one edge of each board, rip the other edge. Then, joint the ripped edge, too.

Now, with a jointer flatten the face side of each board as shown at *far left* on this page. (A few 1/32"-deep passes should do the trick.) Then, precisely set the jointer fence 90° to the table and joint one edge of each board. Rip the opposite edge (see photo *near left*) so the two edges are parallel. Next, take a light (1/32"-deep) jointing cut on the edge you just ripped. The combined width of these boards should be at least 1/4" greater than the finished width of the tabletop.

alignment. You may have to tap them lightly with a rubber mallet. Once the boards are aligned, tighten the clamps, wipe away glue squeeze-out with a damp rag, and put clamps on the top side of the glue-up, spaced between the bottom clamps as shown on the *first page* of this article.

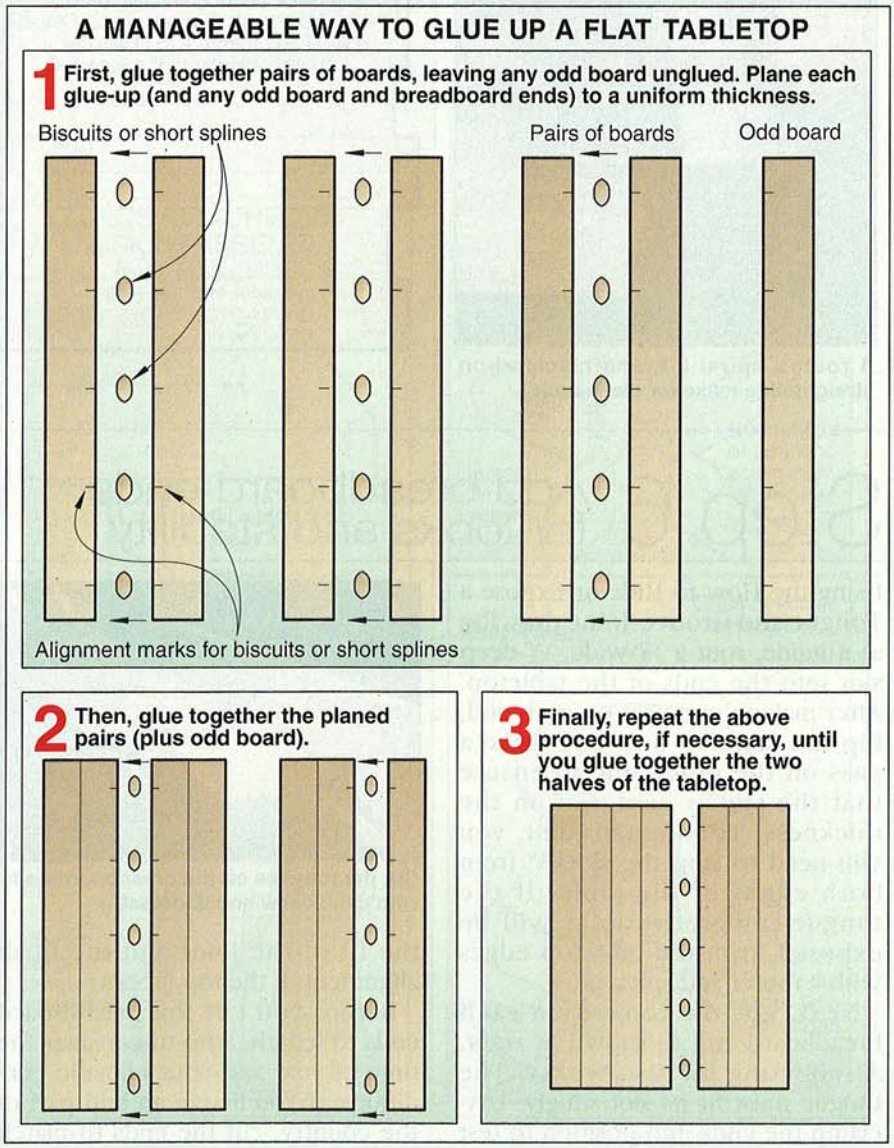
Allow the glue to dry for at least two hours, then scrape off any glue that escaped your earlier wiping. Thickness plane the glue-ups, any odd-numbered boards, and the breadboard ends to a uniform thickness. Be careful to place the jointed faces down on the planer bed as shown at *left*.

Once the unjointed side is flat, you may want to make a light planing pass on the face side just to remove any glue or jointer marks. Don't be overly concerned if you plane all of the pairs to a uniform 1" thickness and find that the bottom sides of some pairs have small unplaned areas. Nobody will notice them on the bottom of the finished table, so long as they're not along the edges.

Glue up the planed pieces in pairs until the entire tabletop comes together. Again, remember to index your slots from the jointed faces.

Continued

A MANAGEABLE WAY TO GLUE UP A FLAT TABLETOP


1 First, glue together pairs of boards, leaving any odd board unglued. Plane each glue-up (and any odd board and breadboard ends) to a uniform thickness.
Biscuits or short splines
Pairs of boards
Odd board
Alignment marks for biscuits or short splines
2 Then, glue together the planed pairs (plus odd board).
3 Finally, repeat the above procedure, if necessary, until you glue together the two halves of the tabletop.

Solid-Wood Tabletop

Step 5 Trim the tabletop ends square and straight

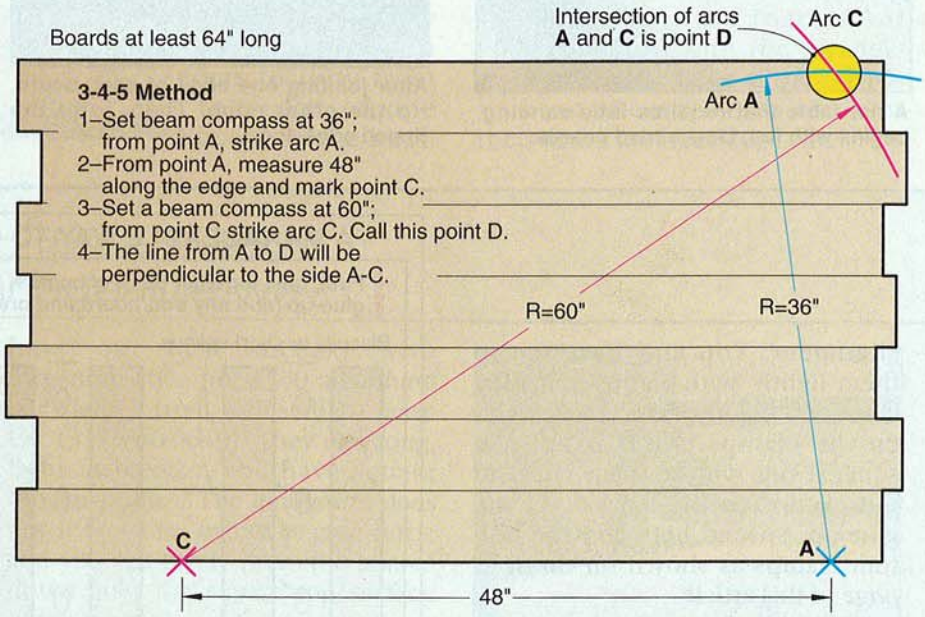
Mark the tabletop to the correct length, with the ends square to the edges, using the 3-4-5 method described at *right*. With this time-tested squaring method, one side of the 3-4-5 triangle is a multiple of 3 (say 3x12=36"), one side equals 4 times the multiple (4x12=48"), and the diagonal connecting them is a multiple of 5 (5x12=60").

Use a jigsaw to cut to within about ¼" of the line marked along the end. Clamp a straightedge to the tabletop and cut to the line with a router as shown *below*. A straight bit will work, but a spiral bit cuts more smoothly through this end grain.

A router, spiral bit, and clamped-on straightedge make for clean ends.

As mentioned earlier and shown at *right*, you can join the breadboard ends to the tabletop with hidden or exposed tongue-and-groove joints. If you elect to expose this joint, go to the next step. If the joint will be hidden, trim the edges of the tabletop to finished width now using the same router-and-straightedge procedure employed on the ends.

GETTING SQUARE: AS EASY AS 3-4-5


Boards at least 64" long
Intersection of arcs A and C is point D
Arc C
Arc A
3-4-5 Method
1–Set beam compass at 36"; from point A, strike arc A.
2–From point A, measure 48" along the edge and mark point C.
3–Set a beam compass at 60"; from point C strike arc C. Call this point D.
4–The line from A to D will be perpendicular to the side A-C.
R=60"
R=36"
C
A
48"

Step 6 Add breadboard ends for looks and stability

Using the How to Hide or Expose a Tongue-and-Groove Joint drawing as a guide, rout a ⅜"-wide, ½"-deep slot into the ends of the tabletop. After making one pass on each end, flip the tabletop over and make a pass on the other side to ensure that the slot is centered on the thickness. To hide the joint, you will need to stop the slot ¼" from both edges of the table. If the tongue-and-groove joint will be exposed, trim the tabletop edges with a router and spiral bit.

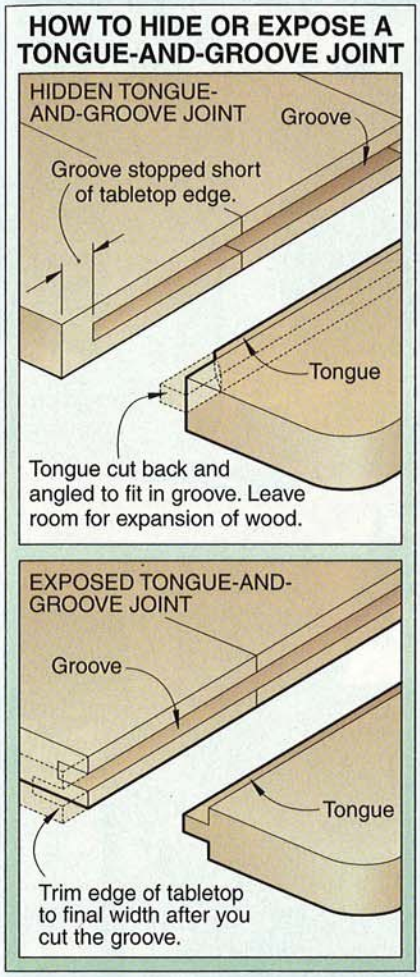
Next, cut the tongue on each breadboard end as shown at *right*. A rabbeting bit also works. The tongue must fit its slot snugly. Dry-clamp the ends into position to test the fit of the joint and the flush alignment of the top faces.

Cut the tongues on the breadboard ends with a tablesaw and dado set.

Before you cut the breadboard ends to length, stop to consider the time of year and your climatic conditions. If you live in an arid part of the country, cut the ends to match the width of the tabletop. In areas with dry winters and humid summers, cut the ends to match the width of the tabletop if you're working during the summer. During the winter, cut the ends about ¼" too long—the tabletop will swell to match the length of the breadboard ends during more humid times.

Apply glue to only the center 4" of the tongue-and-groove joint, and clamp the breadboard ends to the tabletop. This will allow the tabletop to expand and contract freely with swings in humidity levels.

Now, radius the corners of the tabletop if you so desire. Then, profile the edges with a round-over or other router bit.


HOW TO HIDE OR EXPOSE A TONGUE-AND-GROOVE JOINT
HIDDEN TONGUE-AND-GROOVE JOINT
Groove
Groove stopped short of tabletop edge.
Tongue
Tongue cut back and angled to fit in groove. Leave room for expansion of wood.
EXPOSED TONGUE-AND-GROOVE JOINT
Groove
Tongue
Trim edge of tabletop to final width after you cut the groove.

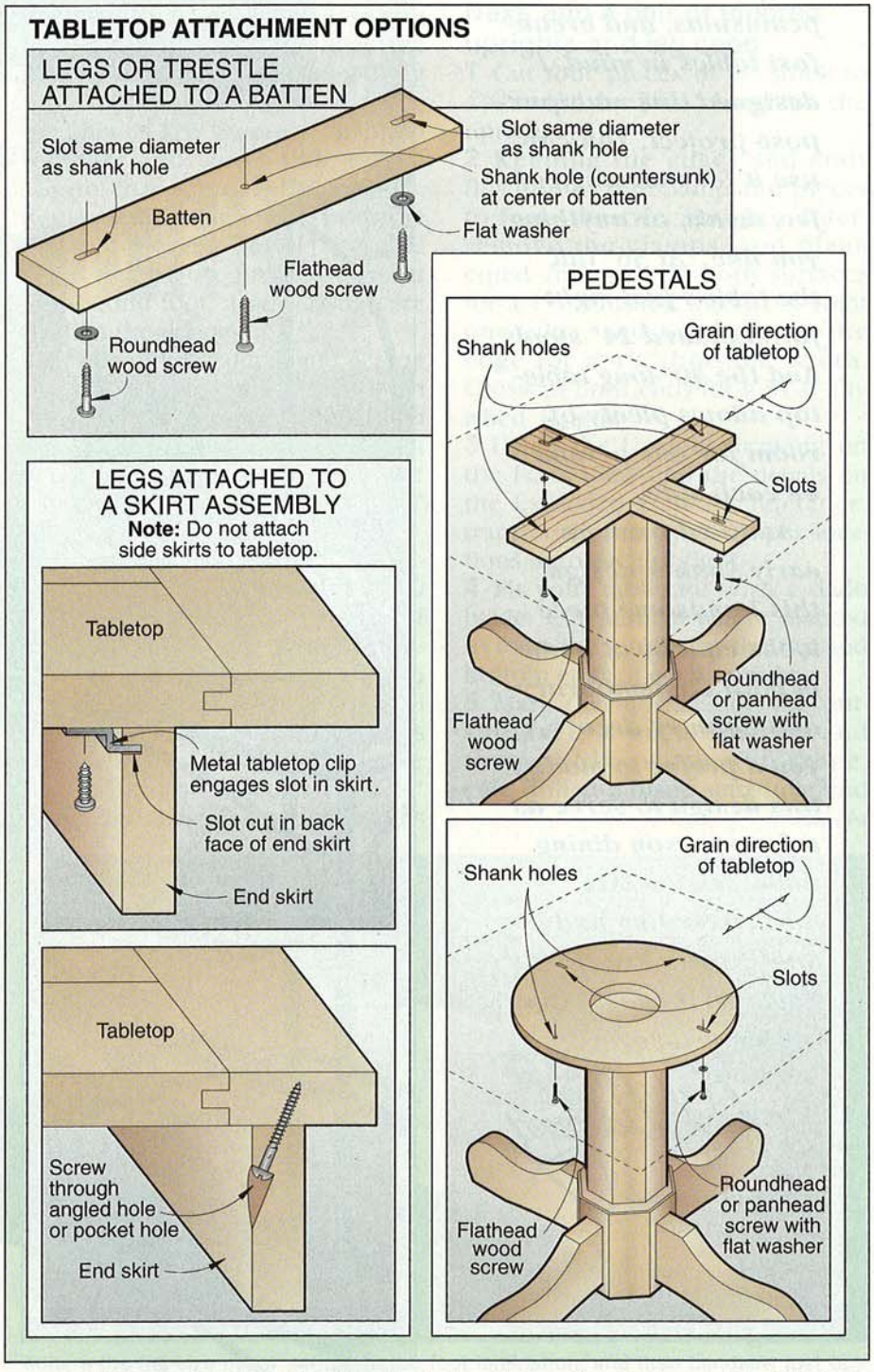
Step 7

Smooth the top by lightly sanding it

At this point, your tabletop should require only a light sanding to remove planer marks and some ever-so-slight misalignment between the tops of the boards. We prefer to use a random-orbit sander, the type with its motor directly above the pad, starting with 80-grit sandpaper and going through a progression of 100-, 150-, and 220-grit abrasives. If you stain the tabletop, stop at 150-grit and final-sand the surface by hand, going in the direction of the grain, with a 150-grit abrasive and hardwood block.

Step 8 Choose among these attachment options

You can attach the tabletop to its base in any number of ways. In the drawings *below* we show you how to attach the top to a batten that in turn attaches to legs or a trestle base, two ways for attaching the top to a skirt, and two pedestal-base attachment options. All of these alternatives allow the top to expand and contract freely across its width with changes in humidity—something that's essential no matter what type of solid-wood top and base you're working with.


TABLETOP ATTACHMENT OPTIONS
LEGS OR TRESTLE ATTACHED TO A BATTEN
Slot same diameter as shank hole
Batten
Slot same diameter as shank hole
Shank hole (countersunk) at center of batten
Flat washer
Flathead wood screw
Roundhead wood screw
PEDESTALS
Shank holes
Grain direction of tabletop
Slots
Roundhead or panhead screw with flat washer
Flathead wood screw
LEGS ATTACHED TO A SKIRT ASSEMBLY
Note: Do not attach side skirts to tabletop.
Tabletop
Metal tabletop clip engages slot in skirt.
Slot cut in back face of end skirt
End skirt
Tabletop
Screw through angled hole or pocket hole
End skirt
Shank holes
Grain direction of tabletop
Slots
Roundhead or panhead screw with flat washer
Flathead wood screw

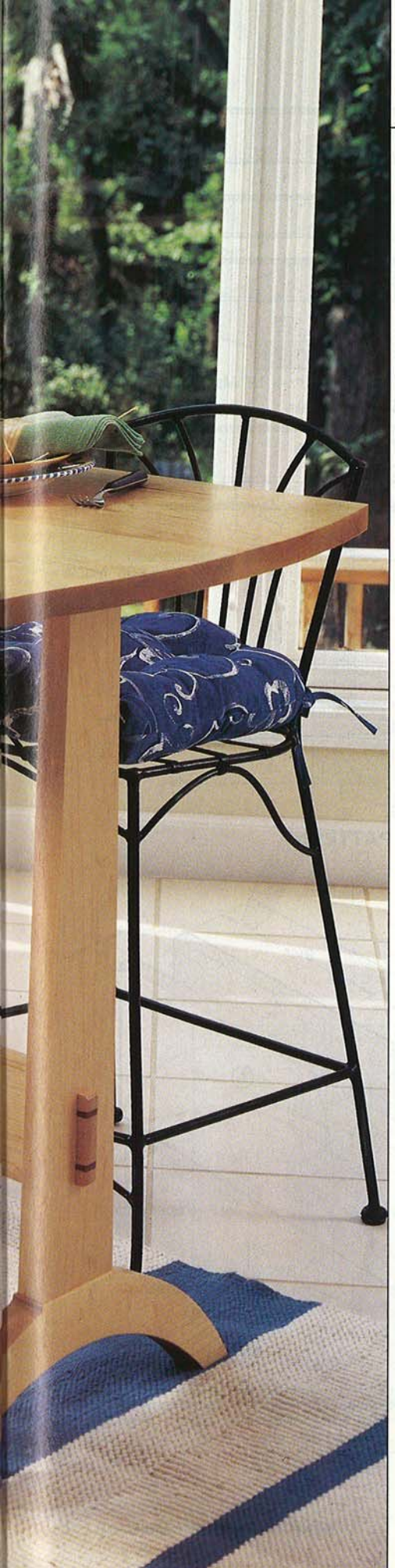
Written by Bill Krier with Jan Svec Illustrations: Kim Downing Photographs: John Hetherington

High-Rise Trestle Table

With the popularity of kitchen islands, peninsulas, and breakfast tables in mind, I designed this multipurpose project. You can use it for morning coffee, meals, or anything you like. At 36" tall, the table's just right for standard 24" stools. And the 40"-long tabletop allows plenty of room for one person on each side.

Adapted from an early Shaker-design, this handsome piece looks equally at home in both Contemporary and Country decors. If you'd prefer to modify this design to serve as a four-person dining table, see the box labeled Seating and Sizing for a Trestle Table on the last page of this article.

James R. Downing,
Design Editor



Start with a pair of arched feet

1 Cut four pieces of ¾" stock to 6½" wide by 22½" long for the feet (A). (We used hard maple for this project.)

2 Cut a 3½" dado ⅜" deep, centered across each piece.

3 Cut a scrap spacer measuring ⅝×3½×3½". Using this to align the dadoes in two of the dadoed leg pieces, glue them together. Once the pieces are securely clamped together and won't slide out of alignment, remove the spacer. Remove any excess glue from the dadoed opening before the glue dries. Repeat the process to form the second foot, again taking care to align the dadoes.

4 Remove the clamps, and scrape the excess glue off the bottom edge of each lamination. Then joint the bottom edge of each foot lamination, and rip the opposite edge of each lamination for a 6⅜" finished width.

5 Duplicate and adhere the full-size half pattern from the *WOOD PATTERN*® insert in the center of the magazine to one of the laminations. Make sure the dashed dado lines on the patterns aligned with the mortise in the lamination. As shown in *Photo A*, bandsaw the foot to shape. (We used a ⅜" blade, and sanded the tight radius with a ⅝" spindle sander where shown on the pattern.)

6 Sand the bandsawn edges smooth to remove the saw marks. Next, trace the foot's outline onto the remaining foot lamination. Bandsaw and sand it to shape.

Next, add a pair of tapered uprights and leg caps

1 Cut four pieces of ¾" stock to 4⅞" wide by 31½" long for the uprights (B).

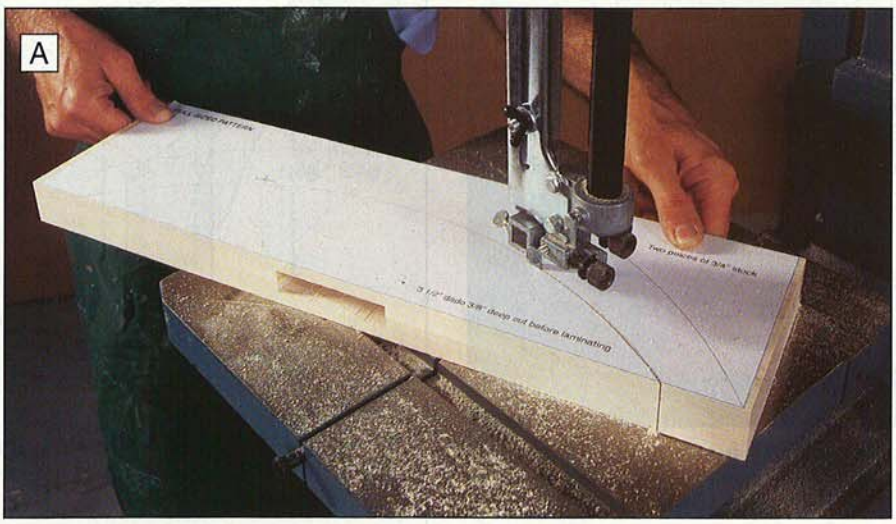
2 Keeping the edges and ends flush, glue and clamp the pieces to form the two uprights. Later, remove the clamps, and plane equal amounts off both surfaces for a 1¼" finished thickness. Joint one edge, and rip the opposite edge for a 4¾" finished width. Crosscut both ends for a 31⅛" finished length.

3 Using the Upright drawing on the Parts View and the details on the Exploded View for reference, transfer the tenon and taper locations onto each upright.

4 Fit your tablesaw with a dado blade. Cut rabbets where marked to form the tenons on the top and bottom ends of each upright.

5 Mark the mortises on the outside face of each upright, and then cut the mortises to shape. (We drilled a blade start hole and

Continued



Adhere the full-size paper pattern to the foot lamination, and then bandsaw just outside the marked cutlines to cut the foot to shape.

Trestle Table

scrollsawed the mortises to shape. You could also remove most of the waste with a drill bit, and then chisel the sides smooth.)

6 Bandsaw just outside the marked mortise lines. Then joint to the line as shown in *Photo B*.

7 Cut the leg caps (C) to size. Rout a ¾" round-over along the bottom ends of each cap.

8 Cut a mortise in the center of each leg cap where shown on the Parts View drawing. The mortise in the leg cap should fit snug on the upright tenon.

9 Mark the locations, and form a pair of screw expansion slots on each cap. Then mark the center-points, and drill a pair of shank holes through each cap.

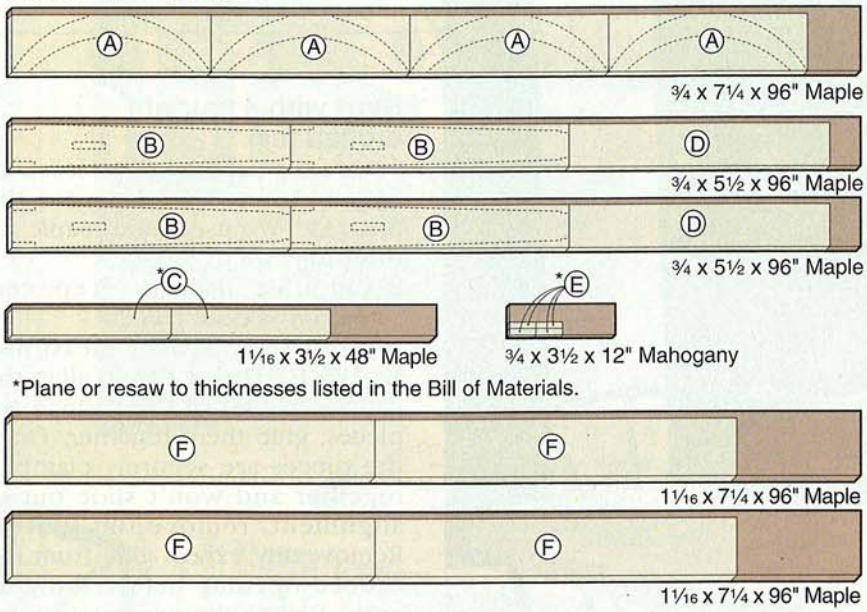
10 Glue and clamp the two leg assemblies (A, B, C) together.

11 Trim and sand flush the tenon protruding from the bottom arched edge of each foot. (We used a 3" spindle sander.)

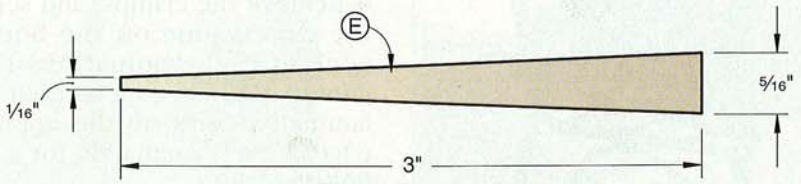
After cutting just outside the marked taper lines, use your jointer to joint to the line for a flat edge.

Continued

CUTTING DIAGRAM



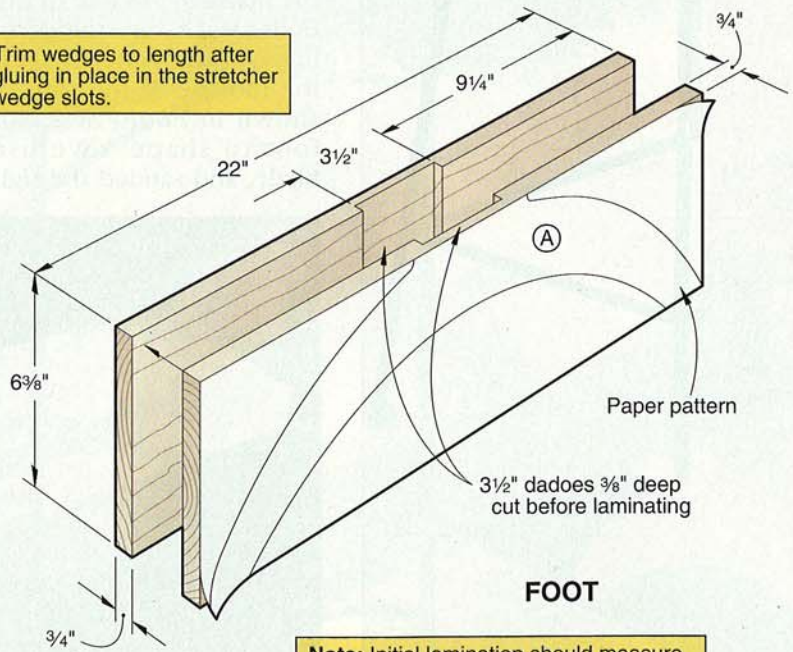
*Plane or resaw to thicknesses listed in the Bill of Materials.



WEDGE

FULL-SIZE PATTERN

Note: Trim wedges to length after gluing in place in the stretcher wedge slots.



FOOT

Note: Initial lamination should measure 6½ x 22½" before trimming to the finished size shown here.

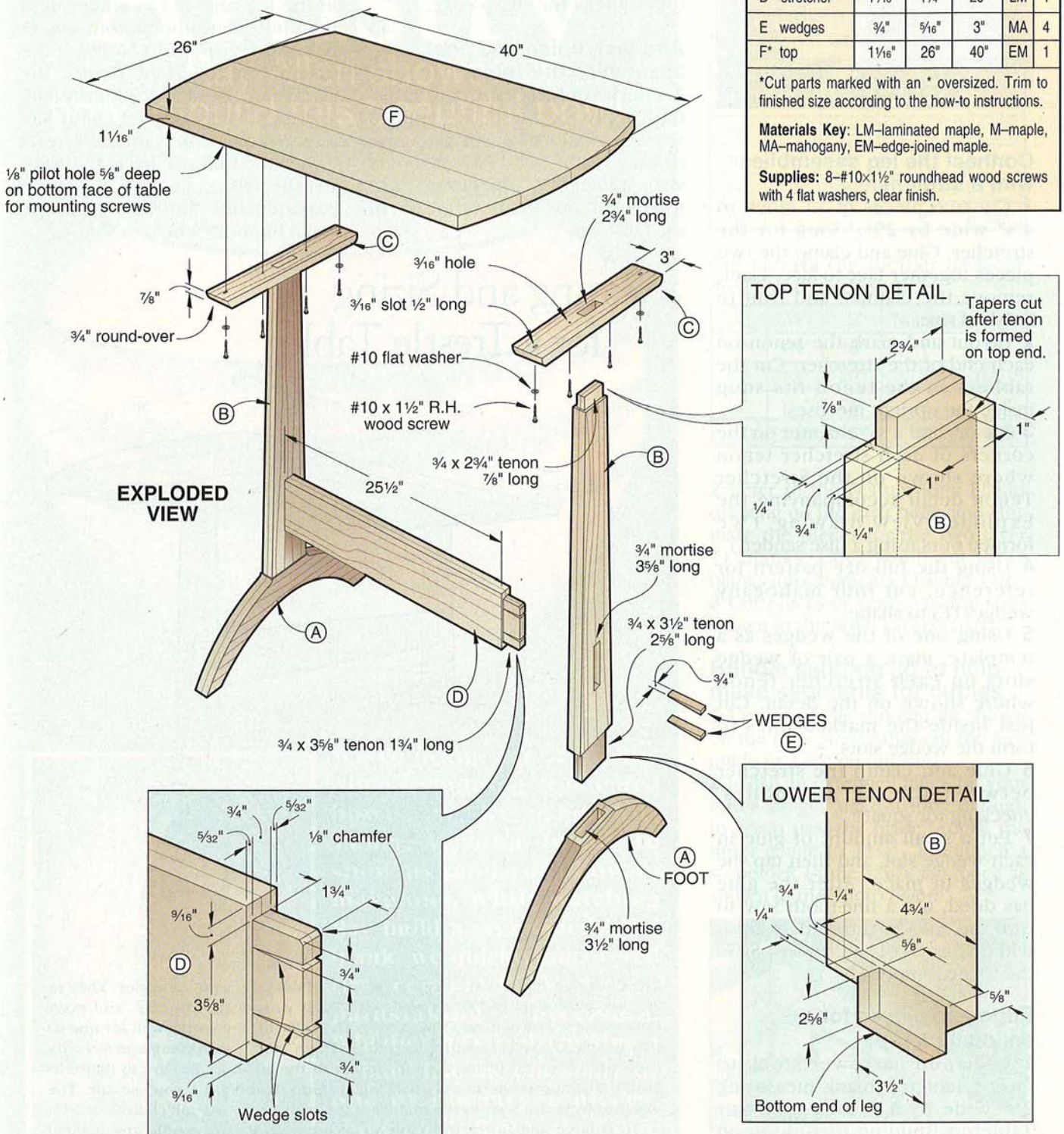
SEE THE *WOOD PATTERNS*® INSERT FOR FULL-SIZE PATTERNS AND PARTS VIEW DRAWINGS

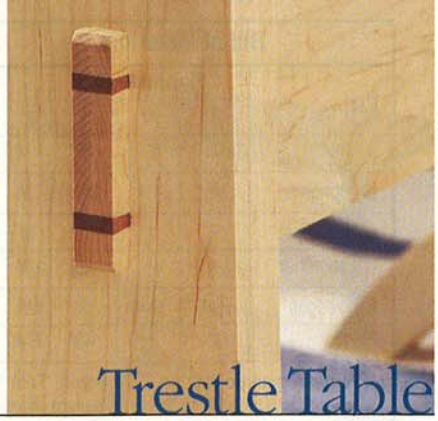
Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A* feet	1½"	6⅜"	22"	LM	2
B* uprights	1¼"	4¾"	31⅛"	LM	2
C leg caps	⅞"	3"	18"	M	2
D* stretcher	1⅛16"	4¾"	29"	LM	1
E wedges	¾"	5⁄16"	3"	MA	4
F* top	1⅛16"	26"	40"	EM	1

*Cut parts marked with an * oversized. Trim to finished size according to the how-to instructions.

Materials Key: LM–laminated maple, M–maple, MA–mahogany, EM–edge-joined maple.

Supplies: 8–#10×1½" roundhead wood screws with 4 flat washers, clear finish.





Trestle Table

Connect the leg assemblies with a stretcher

1 Cut two pieces of ¾" stock to 4⅞" wide by 29½" long for the stretcher. Glue and clamp the two pieces together face-to-face. Later, remove the clamps, and trim to finished size.

2 Layout and mark the tenon on each end of the stretcher. Cut the rabbets so the tenon fits snug inside the upright mortises.

3 Cut or sand a ⅛" chamfer on the corners of each stretcher tenon where shown on the Stretcher Tenon detail accompanying the Exploded View drawing. (We formed ours using a disc sander.)

4 Using the full-size pattern for reference, cut four mahogany wedges (E) to shape.

5 Using one of the wedges as a template, mark a pair of wedge slots on each stretcher tenon where shown on the detail. Cut just inside the marked lines to form the wedge slots.

6 Glue and clamp the stretcher between the leg assemblies, checking for square.

7 Put a small amount of glue in each wedge slot, and then tap the wedges in place. After the glue has dried, use a fine-tooth saw to trim the ends of the wedges flush with the ends of the tenons. Sand the tenons smooth.

Edge-join pieces for a solid-stock top

1 Edge-join narrower stock to form a tabletop blank measuring 26" wide by 41" long. See our Tabletop Building technique on *page 70* for reference when forming your tabletop.

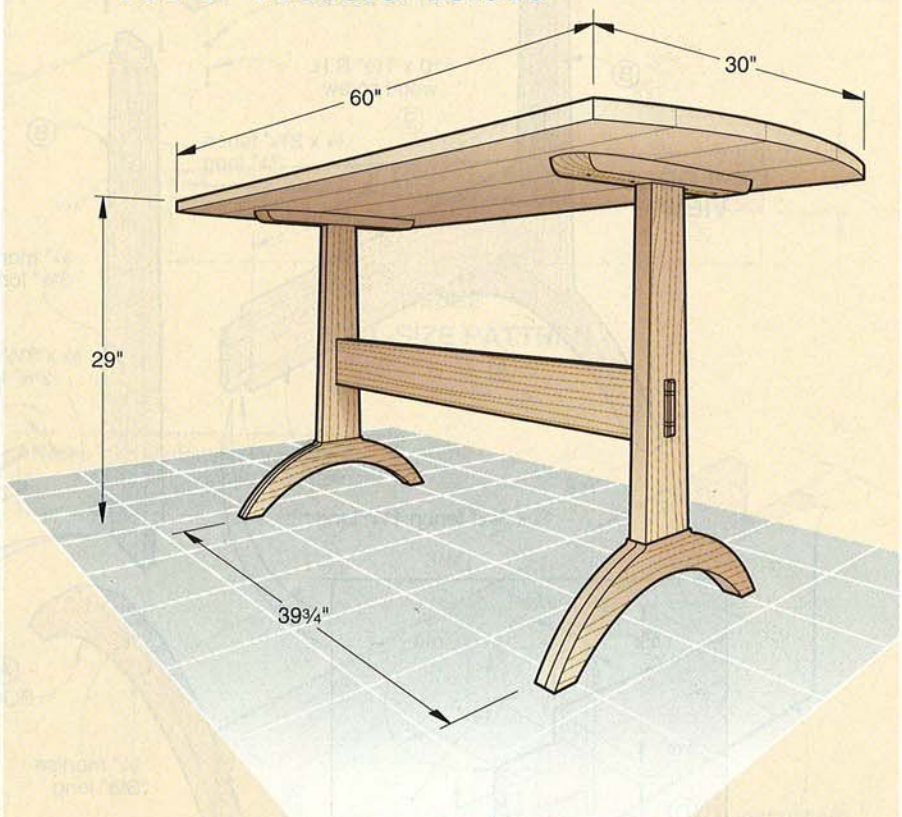
2 Remove the clamps, and scrape off the excess glue. Carefully mark and bandsaw a radius on each end of the tabletop (F). See the Parts View drawing for reference. Sand the surfaces and bandsawn edges smooth. Sand a slight round-over along the top edges of the tabletop to break the sharp edge.

And last, finish and final assemble your table

1 Finish-sand the base and tabletop. Apply the finish (we applied several coats of satin polyurethane, rubbing between coats with 320-grit sandpaper). Don't forget to finish the bottom side of the tabletop.

2 Place a blanket on your workbench top. Position the tabletop (F) upside down on the blanket. Now, center the base (also upside down) on the tabletop. Using the previously drilled holes and slots in the leg caps (C) as guides, drill pilot holes into the bottom side of the tabletop, and screw the assemblies together. Center the screws in the slots, tighten them, and then back them off about half a revolution. You want the screws to be able to move back and forth in the slots as the tabletop expands and contracts with seasonal humidity changes.

Seating and Sizing for a Trestle Table



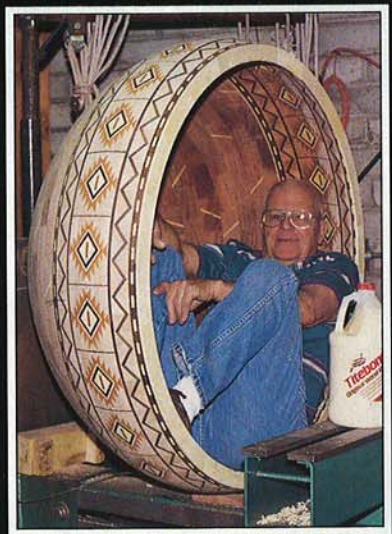
Trestle-design tables have been a favorite of designers for centuries. They're rugged, practical, and fit in well with Early American, Country, and even Contemporary furnishings. Our table with its 26×40" top works well for one or two people. To select seating for our 36"-high table, we recommend keeping the seats 12" to 13" below the top surface of the tabletop. Be sure to figure in cushion compression (usually half the cushion thickness) if you use one. The distance from the floor to the middle of the cushion for our tall chairs was 24".

To enlarge and lower this table to accommodate four people and normal kitchen chairs, we recommend a 30×60" top as shown *above*, as well as shortening the table to 29" high as shown. You'll also need to lengthen the stretcher so the distance between the uprights is 39¾". To accommodate shortening the table, simply shorten the uprights (B) by taking 7" off the top of the uprights.

Project Design: James R. Downing Illustrations: Kim Downing; Lorna Johnson Photography: Perry Struse

Lathe Artistry

Ray Allen shows how to build this beautiful bowl



Ray Allen takes a break during construction of one of his larger vessels. As large as this one is, though, the techniques for building it are the same as described here.

We've long admired Ray Allen's stunning segmented bowls. So we asked the Yuma, Arizona, turner to show us (and you) how to make one. While watching Ray build a segmented bowl blank, we quickly uncovered the secret to his success—painstaking precision. Whether he's constructing a 6" bowl like the one *above* or one of his larger pieces, shown *left*, Ray makes sure every segment fits perfectly. Here are the steps to follow; the precision is up to you.

Cut stock for the layers

1 Rip, resaw, plane, and crosscut the strips that you'll slice into segments for the bowl's rings. Cut curly maple (or another figured, light-colored wood) to these sizes:

T	W	L	Number	Layer
21/32"	1½"	26"	2	6, 15
5/8"	1½"	26"	1	7
3/8"	1½"	20"	2	11A
¼"	1½"	18"	1	4
¼"	1½"	16"	2	11B

Cut imbuya (or another dark-colored wood) to these sizes:

T	W	L	Number	Layer
3/8"	1½"	16"	1	11B
¼"	1½"	20"	2	11A, 18
⅛"	1½"	26"	2	10, 12
⅛"	1½"	16"	2	11B

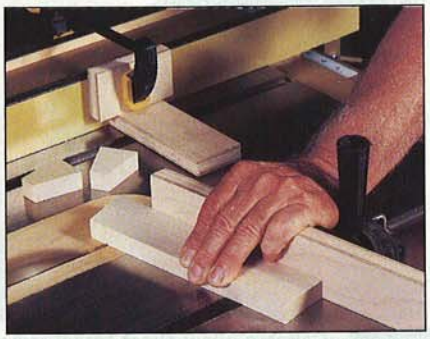
2 Refer to the Feature Ring Blanks drawing on the *next page*, and laminate the pieces for the two layer 11 blanks. Later you'll cut these blanks into segments 11A and 11B.

3 Cut pieces of veneer to the sizes shown in the Bowl Layers chart.

Build a sanding jig to help make segments for circles

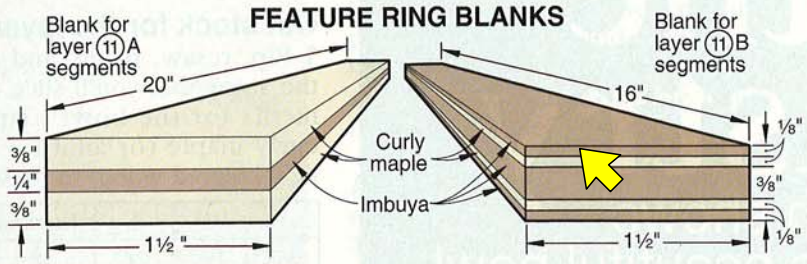
1 Construct the sanding jig shown on the *next page*. Miter-cut the jig's guide to 22½° on one end.

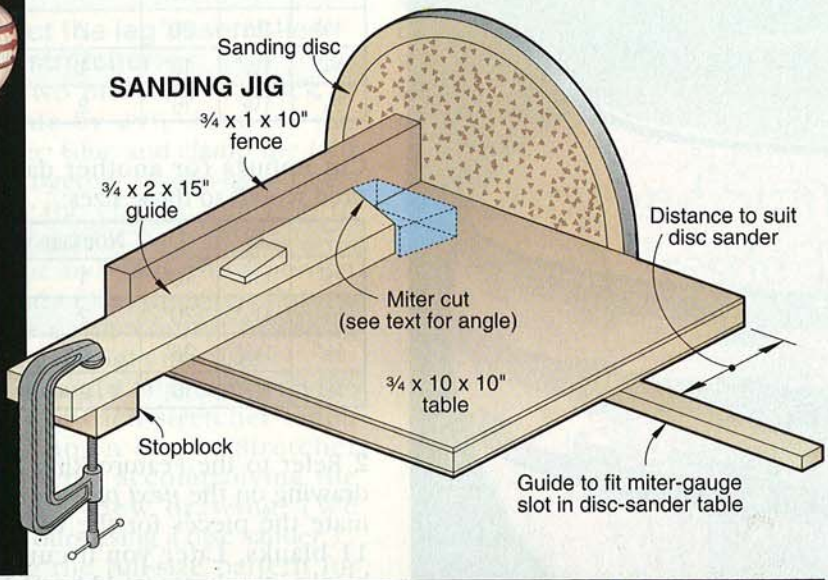
2 Install an extended fence on your miter gauge. Make it long enough to reach past the blade. Adjust the miter gauge to 11¼°, and attach a stopblock to the saw's rip fence as shown in the photo *below*.



Cut the segments to approximate length and angle on your tablesaw. Install a zero-clearance insert.

Continued



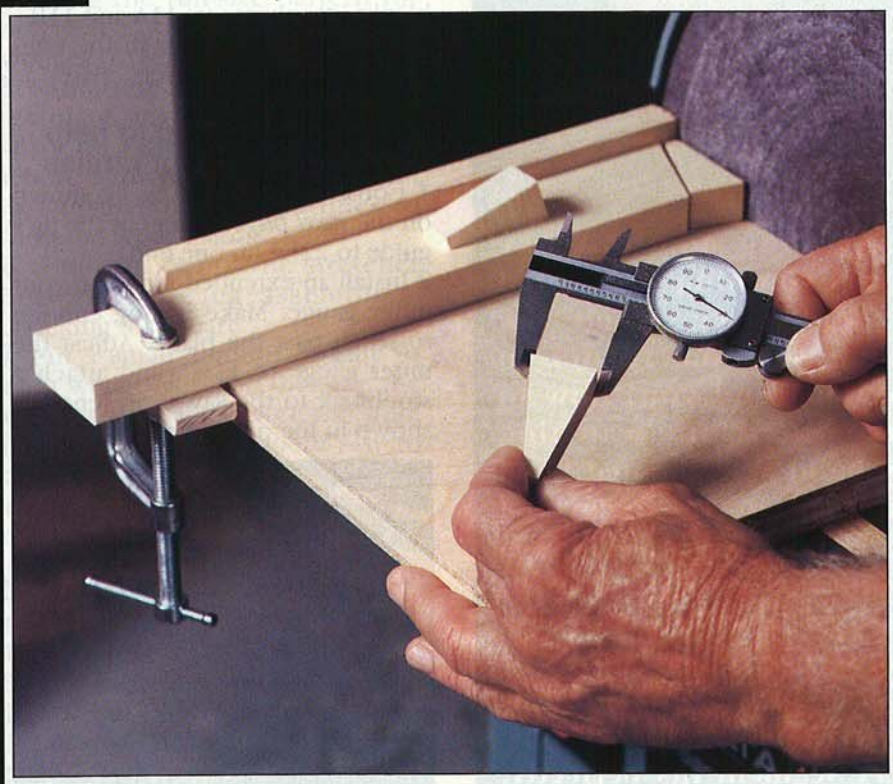

SANDING JIG
Sanding disc
¾ x 1 x 10" fence
¾ x 2 x 15" guide
Distance to suit disc sander
Miter cut (see text for angle)
¾ x 10 x 10" table
Stopblock
Guide to fit miter-gauge slot in disc-sander table

3 Cut at least 17 (because a spare is always handy) wedge-shape segments 1½" long from a ¾×1½×30" piece of scrapwood to test the setup. To minimize waste, flip the stock between cuts.

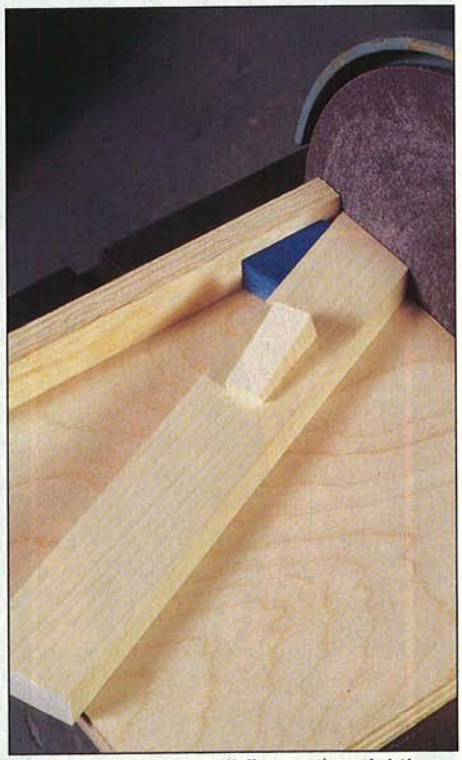
4 Arrange 16 of the test segments in a ring, and clamp them with a hose clamp. (A clamp with a quick-adjustment feature works best.) You'll most likely find gaps, indicated on the Adjusting the Segment Angle drawing.

5 Analyze what it will take to make the segments fit together tightly. If the gaps occur on the inside of the ring, for instance, you'll need to reduce the angle between the ends on each segment to make the outside edge shorter. Do this with the sanding jig.

To change the angle in small increments (and you do want to make only small changes at this point), Ray shims the guide with a strip of masking-tape on the jig's fence, as shown in the Adjusting the Segment Angle drawing.



Calipers allow exact measurement of segment length. The stopblock on the sanding jig's guide ensures identical lengths. This kind of precision gives Ray's bowls their beauty.



When the segments all fit together tightly, use one of them (shown painted blue) to sand the jig's guide to the exact angle needed. Remove the tape shims.

6 Sand both ends of all segments with the shimmed jig. To ensure equal-length segments clamp a stopblock to the guide bar, as shown *opposite page, bottom left.* Sand with the short edge of the segment at the fence. Then, reassemble the segments, check their fit, and readjust, if necessary.

7 Once the test segments fit together properly, remove the tape shims from the fence. Place one of the sanded segments between the fence and guide, small edge toward the sanding disc, and sand the end of the guide to that angle, as shown *opposite page, bottom right.* The jig is now set to sand segments to the correct angle for any size 16-segment ring. Segment length will determine the ring's diameter, but the angle won't change.

8 The bowl's feature ring, layer no. 11, comprises 32 segments instead of 16, as shown in the Feature Ring drawing. These segments must be cut to a different angle. However, because half of them measure .409" long and the rest measure .818", they can't all be cut to the same angle, as shown in the Geometry of the Rings drawing. So, make two more jig guides, one with the end miter cut to 15° (for the long pieces) and another with the end cut to 7.5° (for the short ones).

After you make the two guides, saw 17 test segments 2" long with the miter gauge set at 7.5° and 17 segments 1" long with it adjusted to 3¾°. Fit 16 long and 16 short segments into a ring as shown, and adjust the sanding jig guides as you did earlier.

Continued

SEE THE *WOOD PATTERNS*® INSERT FOR FULL-SIZE PATTERN

Bowl Layers

Layer	Segment Size T	W	L	Matl.	Qty.
1 (base)*	¾"	3¼" dia.		I	1
2**	1/32"	3½"	3½"	MV	1
3**	1/32"	3½"	3½"	BV	1
4	¼"	1½"	.785"	M	16
5, 16**	1/16"	4¼"	4¼"	BV	2
6	21/32"	1½"	1.030"	M	16
7	5/8"	1½"	1.178"	M	16
8, 14**	1/16"	6"	6"	BV	2
9, 13**	1/32"	6"	6"	MV	2
10	⅛"	1½"	1.185"	I	16
11A (long)	1"	1½"	.818"	L	16
11B (short)	1"	1½"	.409"	L	16
12	⅛"	1½"	1.198"	I	16
15	21/32"	1½"	1.153"	M	16
17**	1/32"	4¼"	4¼"	MV	1
18	¼"	1½"	.785"	I	16

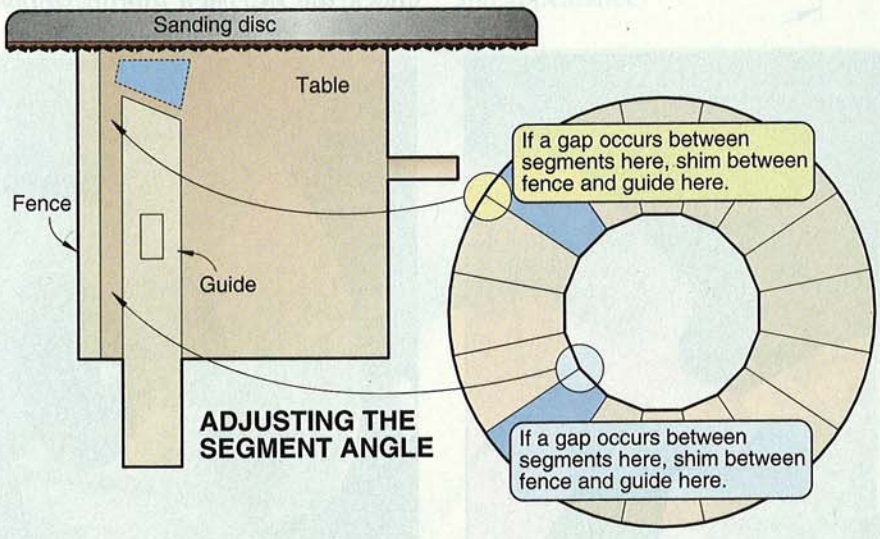
*bandsawn disc **non-segmented veneer layer

Materials Key: I–imbuya, M–curly maple, MV–maple veneer, BV–black veneer, L–lamination of maple and imbuya (see separate drawing).

Buying Guide

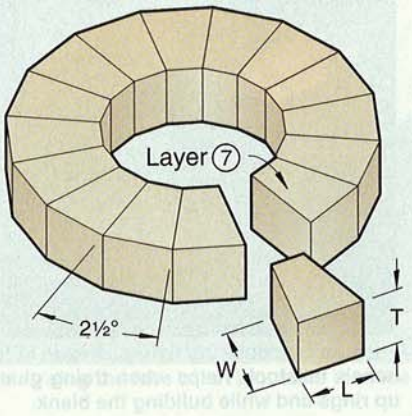
Wood kit. Maple, imbuya, maple veneer, and black veneer to make one bowl. Item no. 1121, $32.95 ppd. in U.S. Heritage Building Specialties, 205 N. Cascade St., Fergus Falls, MN 56537. Call 800/524-4184.

Surgical clamp, Waterlox. Surgical clamps for bowl sanding, available in three lengths, about $4 to $8 each; and Waterlox finish, quart can, about $10, all plus shipping. Craft Supplies USA, 1287 E. 1120 S., Provo, UT 84606. Call 800/551-8876.

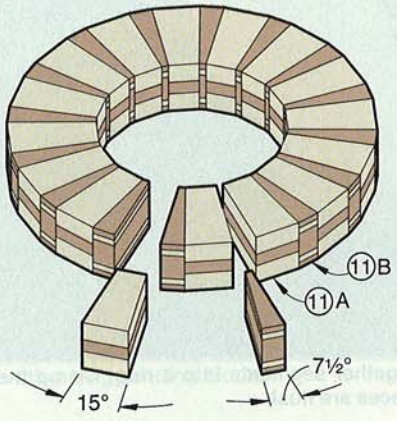

Sanding disc
Table
Fence
Guide
If a gap occurs between segments here, shim between fence and guide here.
If a gap occurs between segments here, shim between fence and guide here.

ADJUSTING THE SEGMENT ANGLE

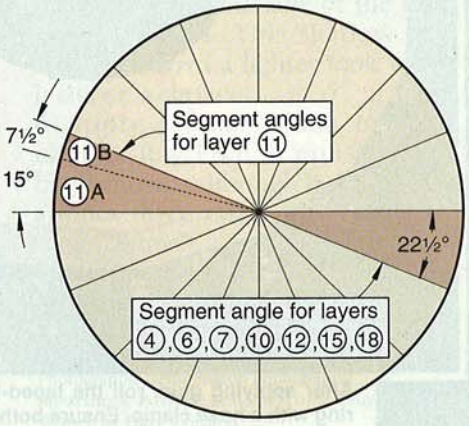
RING ASSEMBLY



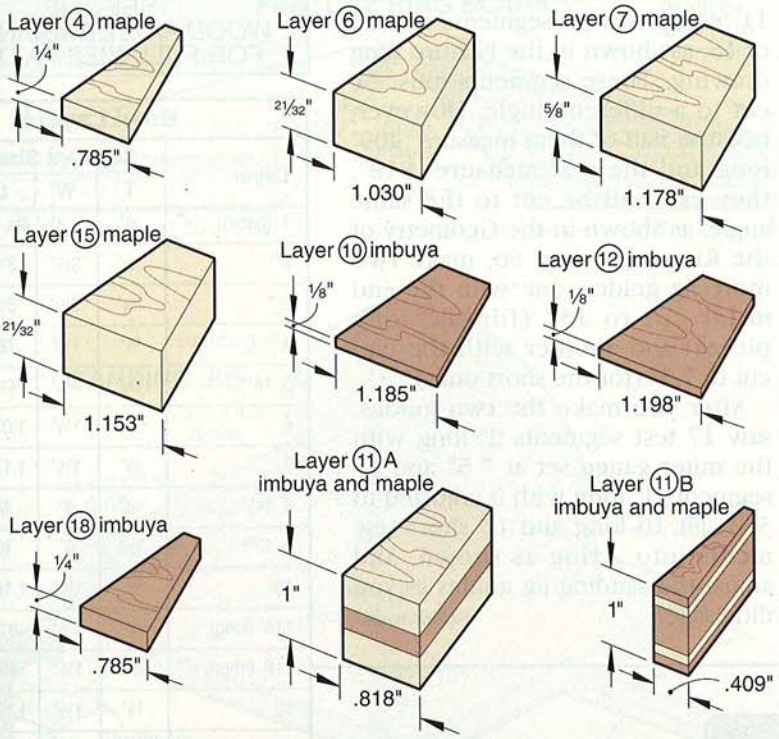
FEATURE RING



GEOMETRY OF THE RINGS



RING SEGMENTS All segments 1½" wide

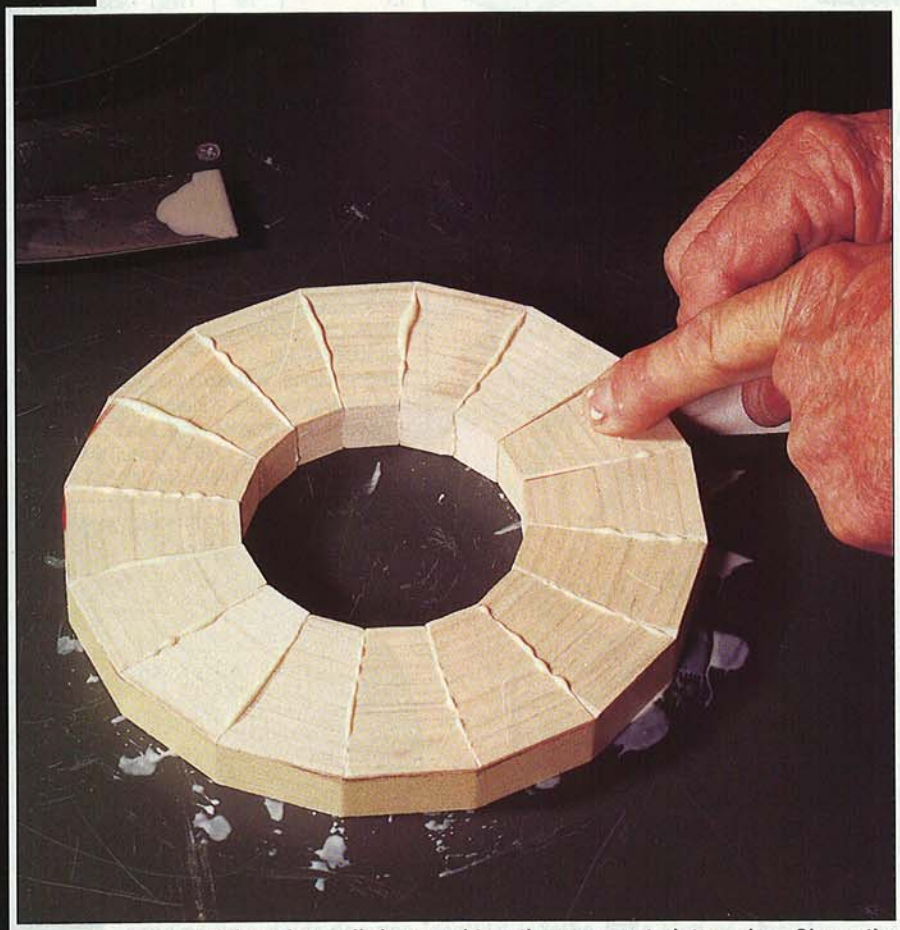


Construct rings and stack them up for a bowl blank

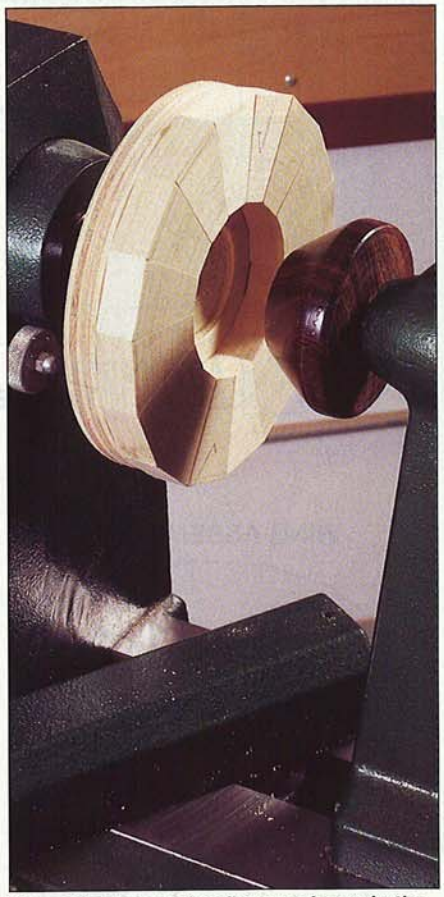
1 Saw the segments for the bowl, setting the stopblock on the saw to make them about 1/16" (.0625") longer than the length shown on the Ring Segments drawing. To avoid mixups, cut the segments for one ring; then assemble that ring before cutting the segments for another one.

2 Sand both ends of the segments to the length shown, using the sanding jig and stopblock. To sand the smaller parts, trap them against the fence and guide of the sanding jig with the point of a scratch awl.

3 Assemble the ring, as shown *below left*. To do this, lay out masking tape, sticky side up, on your bench. (Ray uses two strips for strength.) Press the long edge of the segments onto the tape, and wrap them into a ring to double-check the fit. Then, unroll, apply



After applying glue, roll the taped-together segments into a ring. Clamp the ring with a hose clamp. Ensure both faces are flush.



The conical centering fixture, shown in the lathe's tailstock, helps when truing glued-up rings and while building the blank.

glue to one end of each segment (Ray uses a putty knife), roll them up, and clamp.

4 After building the rings, true one face of each on the lathe. To do so, first turn the tailstock cone fixture for centering the rings shown *opposite page, bottom right* and in the Centering Fixture drawing.

Then, attach a scrapwood disc about 6" in diameter to your lathe's faceplate. True the face and edge of this auxiliary faceplate, and turn a ⅜"-deep recess about 2" in diameter at the center.

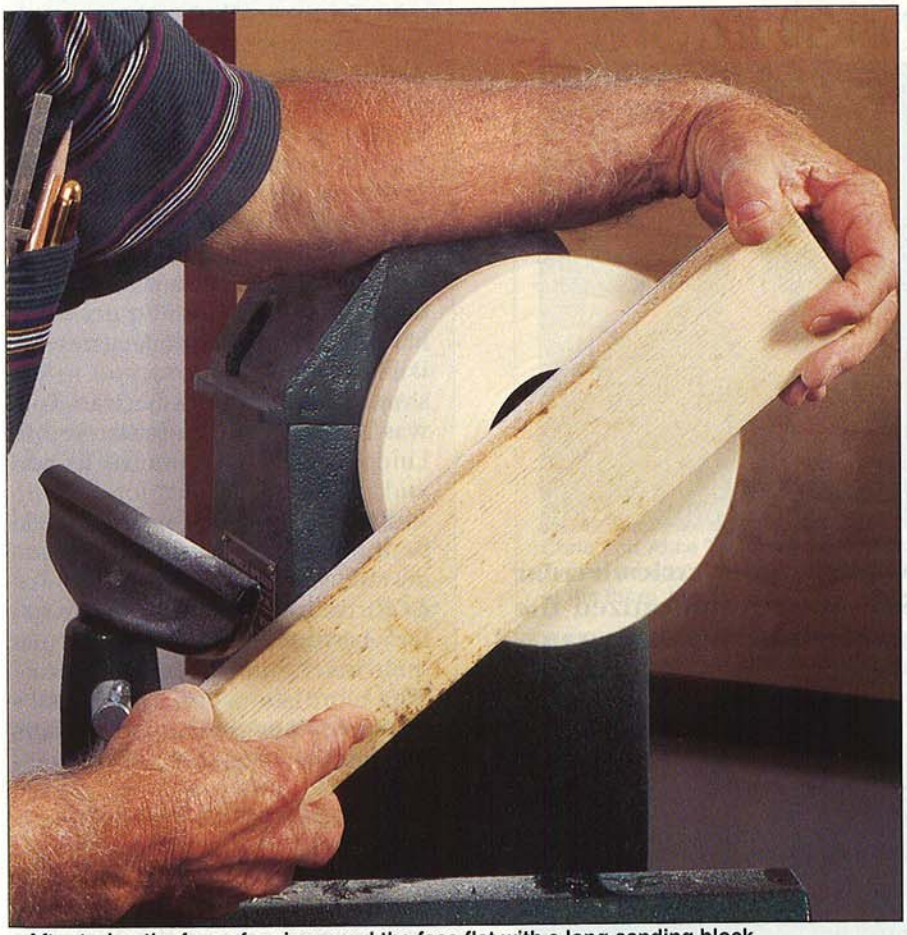
To true the rings, attach each one to the fixture with CA glue, centering it with the tailstock fixture through the hole in the middle of the ring. Turn the face true, and sand it smooth with a large sanding block, as shown *below* Hold the block flat across the face.

5 Bandsaw the base of the vessel, and glue it to a wasteblock screwed to another 3-4" faceplate. True the edge and face. Glue the veneer layers (nos. 2 and 3) to the base. Clamp until dry; then sand the veneer face smooth with the long sanding block.

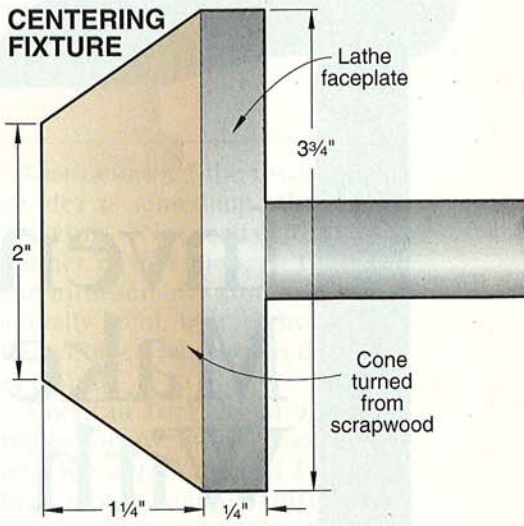
6 Glue on the thin ring (no. 4) next, mating the trued face to the veneer layer. Center it using the tailstock centering jig; then clamp. You can clamp it by placing an appropriately sized scrapwood pad between the ring and the centering fixture.

7 After the glue dries, true the ring's face, using the gouge and sanding block.

8 Continue building up the blank, gluing on the rings and veneer layers in order. The veneer layers can be squares or scrollsawn rings—you don't need to segment them. True the face of each layer before continuing with the buildup. Lay the ring joints brick-wall style for strength and appearance.



After truing the face of a ring, sand the face flat with a long sanding block.



Pick up your turning tools, and give the bowl shape

Turn the glued-up blank as you would any other bowl. Here's the procedure Ray followed to turn the bowl shown:

1 Shape the outside with a gouge.

2 Clean out the inside. Ray turns the wall on a vessel this size to about 3/16" thick.

3 Sand the inside. Ray power-sands with 150-grit to remove tool marks. For finish-sanding, he folds a piece of sandpaper over a small pad of steel wool, and holds it with a long surgical clamp (see the Buying Guide) to reach safely into the deep bowl. Using progressively finer grits, Ray sands to 600-grit inside the bowl.

4 Sand the exterior. Ray again starts with 150-grit, but this time he ends up with 1200-grit paper.

5 With a gouge, form a shallow groove around the side of the base at the bottom. This shadow line lends the bowl a lighter look when it sits on a surface.

6 Apply a clear finish of your choice. Ray French polished the bowl shown, although he ordinarily applies three coats of Waterlox, a tung-oil finish.

2 Part off the bowl. Sand and finish the bottom of the base.

Project Design: Ray Allen
Photographs: Hetherington Photography
Illustrations: Roxanne LeMoine; Lorna Johnson
Written by Larry Johnston

Inventors Make Good With Woodworking Tools

For these originators, ideas dreamed up in their workshops paid off big

The first portable electric circular saw, the Skilsaw, revolutionized the building trade back in the 1920s. Black & Decker's development of the cordless drill in 1961 sparked an industry. Yet even today, new woodworking tools and accessories appear in the marketplace. And they're not always the product of a corporation's research and development team.

PROMISE ON THE PLATTE RIVER: QUICK-GRIP CLAMPS

Tom Chervenak has been involved with American Tool Companies' product development for more than a decade. From his DeWitt, Nebraska, office, he shared his memories of the handy Quick-Grip clamp's development.

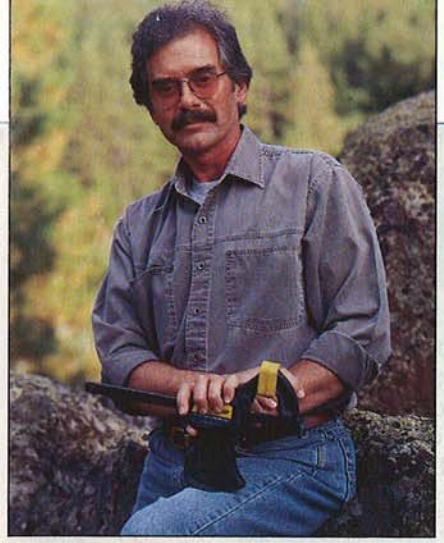
"The Quick-Grip bar clamp came to us in 1986," he began his story. "Joe Sorensen, a well-known Lincoln, Nebraska, oil-color artist was working by himself building a jet-drive boat to run on the Platte River. He was assembling some parts that required positioning as they were being clamped. But with the tools he had, he needed an extra hand because it took two to clamp. So he decided there had to be a better way, and came up with the idea for a one-handed clamp."

As Tom recalled, what was to become the Quick-Grip clamp didn't come close to resembling today's product. "But in function, it worked quite a bit like it."

Tom continued his tale, and spoke of Dwight Gatzemeyer, a friend of Sorensen. "Dwight was a tool and die maker in Lincoln, and the two of them set out to design a device that would allow a person to have one hand free while clamping. Dwight made a prototype in his shop. And because American Tool was at that time headquartered in Lincoln, the two came to us and said, 'We have an idea for a clamp and wondered if you people would be interested in looking at it, and maybe even producing it.' Accordingly, we looked at what they had and basically thought that their invention was a good idea." (For more about American Tool's policy for new ideas, see "Others Need Apply," *opposite page.*)

Development of the one-handed clamp

The process then went something like this, Tom remembered: "The engineering area at the Vise-grip



Joe Sorensen, co-inventor of American Tool Companies' Quick-Grip clamp, at home in Montana.

facility in DeWitt, Nebraska, started evaluating the concept, and decided that it did indeed make sense. The company then applied for a patent, with Joe and Dwight named as co-inventors. In exchange for assigning the patent to American Tool for production, they each received a royalty agreement giving them a percentage of [the money from] Quick-Grip clamp sales. That royalty is paid as long as the patent is in effect.

"We then hired Joe as our manager of research and development," Tom continued. "His first project was refining the one-handed clamp."

Joe went on to work in that capacity with different engineering areas of American Tool, and by 1988 had developed the tool as it looks today. According to Tom, the first Quick-Grip clamp produced was the standard size. Other sizes were later added.

Ingenuity pays off

"By 1995 Joe Sorensen had acquired so much money that he just asked himself one day, 'Why am I doing this?' and retired to Montana," said Tom.

And just how well did Joe Sorensen and Dwight Gatzemeyer do from inventing the Quick-Grip bar clamp? "Quick-Grip bar clamps are one of American Tool's most important products today," replied Tom. "Neither of them needs to worry about money for the rest of their lives."

OTHERS NEED APPLY

"I see between 300 and 400 new product ideas a year," said American Tool's Tom Chervenak. "From those, there may be a dozen that we say 'Hmm, this looks interesting.' From that dozen, two might make it to evaluation."

On top of the submitted ideas, Tom and his assistant annually talk with at least 600 inventors, but never see anything from them. "When I tell them about the disclosure and confidentiality agreements—what they, as inventors, need to do to protect themselves, and what we need to do—they say 'I don't want to sign all those papers,' " Tom explained.

Tom described the usual form of an idea as something other than a drawing. "Necessity still is the mother of invention, so the greatest number of submissions are actually some type of homemade tool cobbled together to do a job," said Tom.

American Tool has an open-door policy for inventions, Tom confided. "We want American Tool to be known in the world of inventors as a very fair company that will look at submissions. And it's paid off. Sure, we'd like to see another Quick-Grip bar clamp walk in, but most companies don't even get one of those in their lifetime."

A NICHE FOR POSITIONING: THE INCRA JIG

Chris and Alice Taylor, owners of the Taylor Design Group, manufacturer of the Incra Jig.

With incremental adjustments, the Incra Jig has incredible positioning accuracy for complex joinery.

"I designed the Incra Jig in 1986," said Chris Taylor over the phone from Dallas. It's there that he and his wife, Alice, operate The Taylor Design Group, producer of the renowned Incra Jig and accessories. "I was an electrical engineer for Texas Instruments in their oil exploration systems. But oil was taking a beating back then, so I was reassigned.

"Well, I had been a woodworker for some 10 years," he continued. "And I realized that all dimensions for woodworking projects published in America specify some multiple of 1/32". That's how I came up with the idea of using saw-tooth racks with a 1/32" tooth spacing. It's a lot easier to deliver perfect accuracy at 32 locations per inch rather than at an infinite number of locations. It wasn't until later that we added continuous micro-positioning with accuracy down to 1/1000"."

Chris made jig after jig in his garage woodworking shop. "I finally

Continued

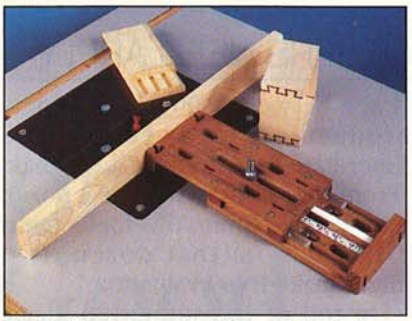
came up with the prototype, out of teak, to fit my router table," he recalled. "Only when I made some acrylic saw-tooth racks that actually meshed together in 1/32" increments did I realize what I had." Today's Incra, called that because of its incremental positions, has accurate adjustment because of those very racks.

Chris didn't take his prototype to a company for development and manufacturing, though. He obtained the patent (see more about this in the column *far right*) and went into business. "I think any major event in someone's life is a time when things just come together. Call it serendipity," he commented. "I was ready for a change and had a little money to invest in tooling and some product literature. So I thought I'd give it a try."

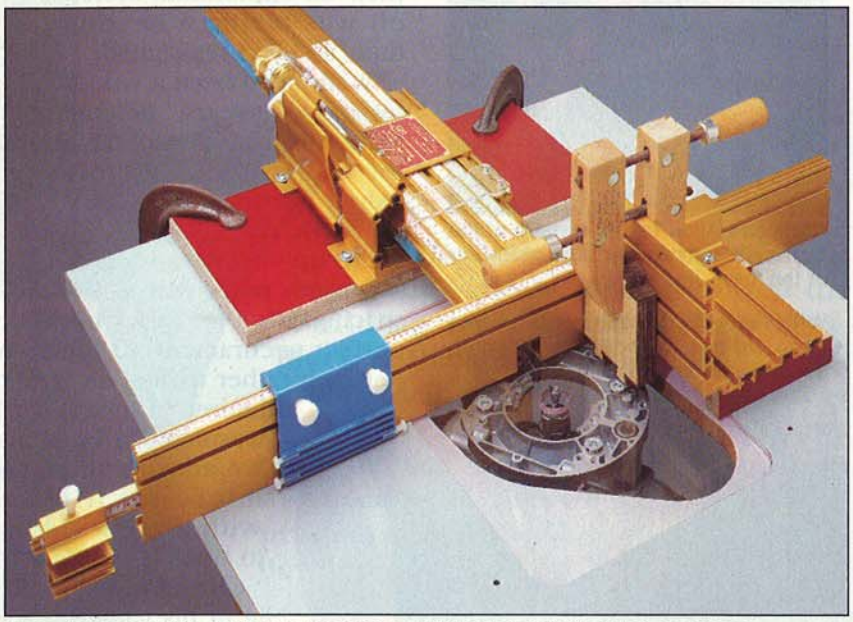
A great idea, however, won't go anywhere without marketing. "I was lucky. My wife, Alice, had an advertising agency that primarily dealt with start-up companies and mom-and-pop operations," he noted. "She helped me with the marketing. But the whole Incra concept sold itself."

According to Chris, in the computer industry there's a commonly used term, "killer application," which means a focus for success—like spreadsheets, for instance. "Our killer application was the dovetail joint. And the real killer, killer application—the thing that made the Incra—was the double, double dovetail, a three-piece dovetail with the third acting as a contrasting detail. This really connected with woodworkers."

The Incra Jig and the complete system that followed now can be found in practically every woodworking tool catalog. But did Chris ever doubt its success? "I was pretty confident, and thought we had a winner before we made the first mold," he said.



Chris Taylor made this original Incra prototype of teak in his garage shop.



Today's Incra Ultra Jig has built on the original's reputation for accuracy.

THE PATENT PROCESS: HERE'S HOW IT WORKS

"It's not a matter of difficulty getting a patent. It's a matter of money because you have to find a good patent attorney," Chris advised. (The basic patent-filing fee charged by the U.S. Patent and Trademark Office for a "small entity," which means an individual or small company, runs only about $400. Legal fees, though, start at about $5,000 and can run into the tens of thousands.)

"You could obtain the patent yourself, but it's much better to hire an experienced professional. It's also important that the inventor document what he or she has done," said Chris. "Drawings, samples, and prototypes provide evidence that you invented the thing. For a chronological history to support it, include dates, times, lab notebooks, even letters to family members. The attorney will digest it, then file a patent application.

"As part of the application," he continued, "you have to sign a document saying that you are the true inventor and know of no other thing like it. In fact, you are under a continuing obligation while the patent is in effect [20 years from the filing date] to report to the patent office any similar product that existed before your patent but that you did not know about prior to filing for your patent."

Actually, you can start manufacturing an invention before you obtain the patent," said Chris. "But you have only a year from the date that you start selling a product to apply for a patent. That's the filing date. It's not uncommon for a patent to take three or four years after the filing date to be issued. With the Incra Jig, it was so novel that it went through in nine months."

Written by Peter J. Stephano
Photographs:
Courtesy of Taylor Design Group,
American Tool Companies,
Doug Todd/Third Eye Photographics

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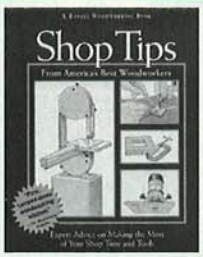

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8-1/4"X60T	$150	**$109**
8"X60T	$150	**$109**
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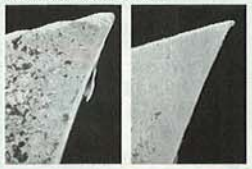

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5397-6	3/8" hammer drill kit	144
0234-6	1/2"vsr 0-850 mag.	129
6368	7-14" saw w/ct bld, cs, fn	149

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N60FN-2 Kit 1-1/4" - 2-1/2" Finish Nailer
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N80S-1	16d stick nailer	319
N80C-1	**New** coil nailer	319
BT50-Kit	1-3/16"-2"brd nlr kit	169
532SX-Kit	finish stapler kit	139
RN45B-1	**New** roofing nailer	369
MIIIFS	floor stapler	549

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78-931	40" homeshop fence	259
78-930	28" homeshop fence	249

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SLP-20	5/8"-1-5/8" brd nail kt	199
SLS20	finish stapler w/cs	239

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A125BN 18 Gauge 1-1/4" Brad Nailer
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A200BN	18ga 2" brad nailer	134
A150LS1	1-1/2" finish stapler kit	144
A100LS	1" finish stapler kit	114
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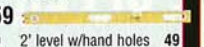

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BN125	18g 1-1/4" finish nail kit	89
NS100	18g1/4" crown stplr kit	94
NS150	18ga 1-1/2"finish stplr	139
FC350	2 - 3-1/2" clip hd nailer	289
FR350	2 - 3-1/2" full hd nailer	289
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9862	12v 3/8" dr kit w/2 bat	159
9872	14.4v dr kit w/2 bat	184
743-K	7-1/4"15 amp saw w/cs	129

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691	1-1/2 hp D handle router	169
697	router table w/router	234
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DW364	7-1/4" saw w/brake	159
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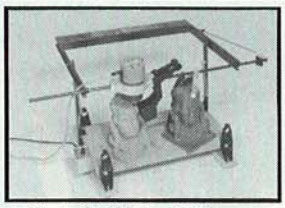

Model T-110 Dupli-Carver

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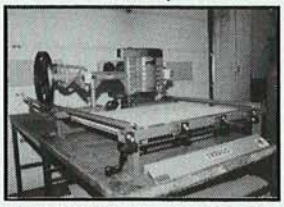

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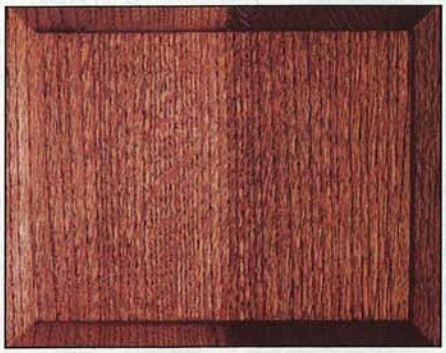
I can't get my stain to match

I've been making a project that has raised panel doors. While test-staining on a similar scrap panel, I noticed the area that slopes turned darker than the flat area in the middle of the panel. How can I get them to match?

—George Pataky, Lorain, Ohio

George, the sloped area darkened more because that wood is actually exposed end grain, while the center of the panel is side grain (long grain). And like a drinking straw, the end draws in liquid, but the sides of the straw can't.

Because of the high absorbancy of end grain, the angled slopes will really soak that stain up, no matter what stain you use, as shown *below right*. Thorough sanding before staining, as shown *below left*, takes care of this problem. You'll find this requires a lot of elbow grease, but work diligently through the grits of sandpaper from 60 to 220 on the raised panel before attaching it to the frame. Once you've sanded the roughness out, the stain will cover the panel evenly.



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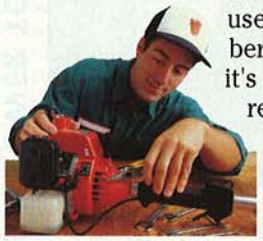

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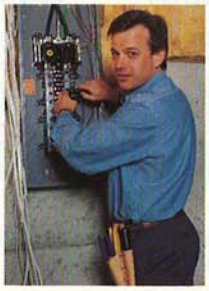

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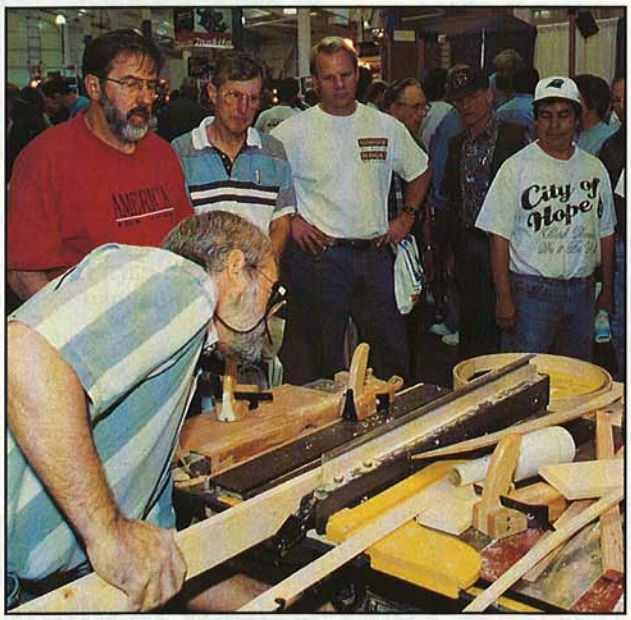

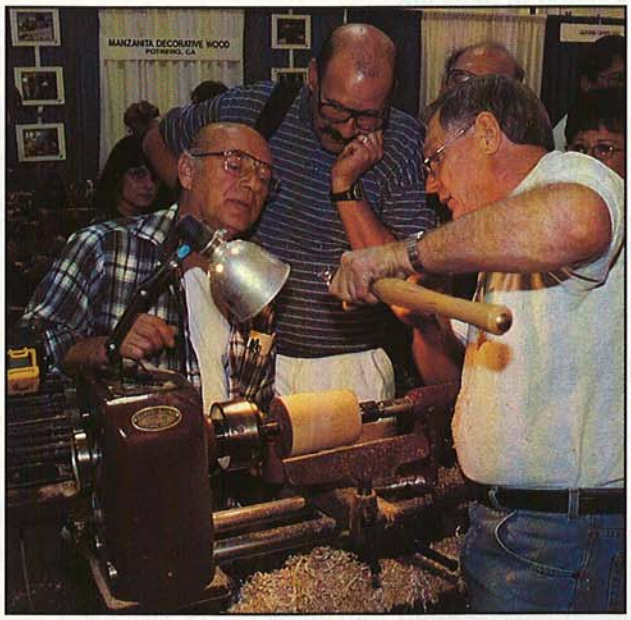

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WL-1045	3/8"	$11.
WL-1046	1/2"	$13.
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WL-1042-5	3/16"	$9.
WL-1050	1/4"	$9.
WL-1044-5	5/16"	$10.
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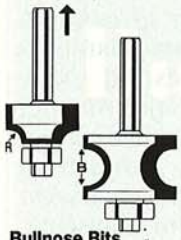

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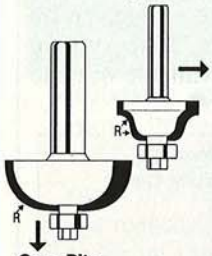

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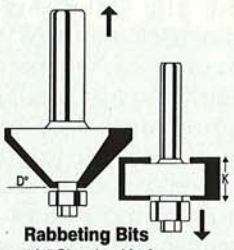
1/2" Shank

WL-1169	1/8"	$10.
WL-1170	1/4"	$11.
WL-1171	3/8"	$13.
WL-1172	1/2"	$14.
WL-1173	5/8"	$18.
WL-1174	3/4"	$20.

Chamfer Bits
1/4" Shank • Degree

WL-1180	15°	$10.
WL-1181	25°	$10.
WL-1182	45°	$12.
WL-1183	45°	$14.
(for up to 3/4" material)		
1/2" Shank		
WL-1184	45°	$10.
WL-1185	11-1/2°	$12.
WL-1186	15°	$12.
WL-1187	22-1/2°	$12.
WL-1188	30°	$14.
WL-1189	45°	$15.
WL-1190	45°	$22.
(for up to 1-1/4" material)		



Rabbeting Bits
1/4" Shank • Kerf

WL-1220	1/2"	$11.
WL-1220-2	1/16"	$10.
WL-1220-3	1/8"	$10.
WL-1220-4	1/4"	$10.
WL-1220-5	3/8"	$10.
1/2" Shank		
WL-1225	1/2"	$11.
WL-1225-2	1/16"	$10.
WL-1225-3	1/8"	$10.
WL-1225-4	1/4"	$10.
WL-1225-5	3/8"	$10.
WL-1225-6	3/4"	$12.

Roman Ogee Bits
1/4" Shank • Radius

WL-1230	5/32"	$13.
WL-1231	1/4"	$15.
1/2" Shank		
WL-1235	5/32"	$13.
WL-1236	1/4"	$15.

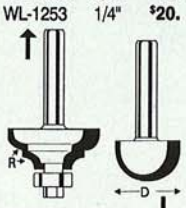
Double Roman Ogee
1/4" Shank • Radius

WL-1240	5/32"	$18.
WL-1241	1/4"	$20.
1/2" Shank		
WL-1245	5/32"	$18.
WL-1246	1/4"	$20.

Ask about our unique "Does It All" ROUTER TABLE

Classical Ogee Bits
1/4" Shank • Radius

WL-1250	5/32"	$18.
WL-1251	1/4"	$20.
1/2" Shank		
WL-1252	5/32"	$18.
WL-1253	1/4"	$20.

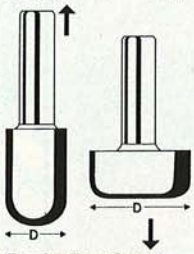


Core Box Bits
1/4" Shank • Diameter

WL-1370	1/8"	$10.
WL-1371	1/4"	$8.
WL-1371-1	3/8"	$9.
WL-1372	1/2"	$10.
WL-1373	3/4"	$12.

Roundnose/Core Box
1/2" Shank • Diameter

WL-1375	1/4"	$8.
WL-1375-1	3/8"	$11.
WL-1376	1/2"	$12.
WL-1377	3/4"	$14.
WL-1378	1"	$16.

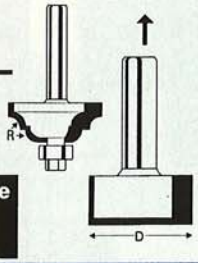


Bowl & Tray Cutter
1/4" Shank • Diameter

WL-1380	7/16"	$13.
WL-1381	3/4"	$15.
1/2" Shank		
WL-1385	3/4"	$15.
WL-1386	1-1/4"	$18.

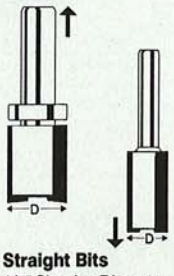
Dado & Planer Bit
1/4" Shank • Diameter

WL-1390	3/4"	$12.
1/2" Shank		
WL-1391	3/4"	$12.
WL-1392	1"	$14.
WL-1393	1-1/4"	$15.
WL-1394	1-1/2"	$16.
WL-1394-1	2"	$28.



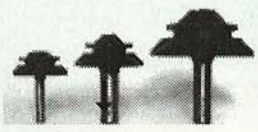
Pattern Cutting Bit
1/4" Shank • Diameter

WL-1400	1/2"	$12.
WL-1401	5/8"	$12.
WL-1402	3/4"	$12.
1/2" Shank		
WL-1405	3/4"	$15.
WL-1406	1-1/8"	$16.



Straight Bits
1/4" Shank • Diameter

WL-1001	1/8"	$10.
WL-1002	3/16"	$5
WL-1002-5.5	5.5mm	$5.
(for undersized 1/4" plywood)		
WL-1003	1/4"	$5.
WL-1004	5/16"	$5.
WL-1005	3/8"	$5.
WL-1006	15/32"	$5.
(for undersized 1/2" plywood)		
WL-1007	1/2"	$6.
WL-1008	9/16"	$6.
WL-1009	5/8"	$7.
WL-1010	23/32"	$8.
(for undersized 3/4" plywood)		
WL-1011	3/4"	$9.
WL-1012	1"	$10.
1/2" Shank		
WL-1020	15/64"	$5.
(for undersized 1/4" plywood)		
WL-1021	1/4"	$5.
WL-1019	5/16"	$5.
WL-1022	3/8"	$5.
WL-1023	7/16"	$5.
WL-1024	15/32"	$5.
(for undersized 1/2" plywood)		
WL-1025	1/2"	$6.
WL-1027	5/8"	$8.
WL-1028	23/32"	$8.
(for undersized 3/4" plywood)		
WL-1029	3/4"	$9.

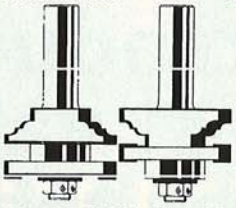


Corner Lock Mitres
For up to 5/8" material
WL-1420-2 1/4" shank $25.
For 1/2" to 3/4" material
WL-1420-1 1/2" shank $30.
For material 3/4" to 1-1/4"
WL-1420 1/2" shank $38.

For the Shaper
Lock Mitre WL-1581 $40.

Horizontal Panel Raiser - 3 1/2" Dia. with Undercutter • 1/2" Shank

WL-1346	Ogee	$49.
WL-1347	Traditional	$49.
WL-1348	Convex (Cove)	$49.
WL-1359	12° Facecut with Quarter Round	$49.
WL-1363	Wave	$49.

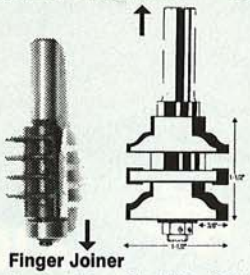


2-piece Rail & Stile Cutter Sets

1/2" Shank		Set
WL-1360	Ogee Profile	$59.
WL-1361	Roundover	$59.
WL-1362	Cove & Bead	$59.

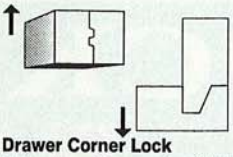
1-piece Rail & Stile Cutter Sets
Just raise the cutter to make the matching cut. No changing or reversing.
1/2" Shank

WL-1365	Ogee Profile	$49.
WL-1366	Roundover	$49.
WL-1367	Cove & Bead	$49.
WL-1368	Wedge	$49.
WL-1374	Dbl Roundover	$49.



Finger Joiner
Router Bit WL-1429 $39.
For the Shaper WL-1580 $89.

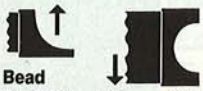
Reversible Glue Joint
WL-1430 1-3/4" Diam $35.
For the Shaper WL-1706 $35.



Drawer Corner Lock
Makes drawer side separation virtually impossible
1/2" Shank
WL-1435 For 1/2" material $30.

SHAPER CUTTERS
3/4" BORE
Corner Round

WL-1509	1/8"	$22.
WL-1510	1/4"	$24.
WL-1511	3/8"	$26.
WL-1512	1/2"	$26.
WL-1513	3/4"	$30.
WL-1514	1"	$32.
WL-1515	1-1/4"	$38.

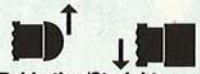


Bead

WL-1520	1/4"	$24.
WL-1521	3/8"	$26.
WL-1522	1/2"	$26.
WL-1523	3/4"	$28.
WL-1524	1"	$30.

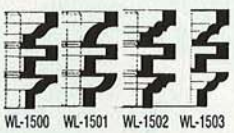
Flute

WL-1530	1/4"	$24.
WL-1531	3/8"	$26.
WL-1532	1/2"	$26.
WL-1533	3/4"	$28.
WL-1534	1"	$30.



Rabbeting/Straight

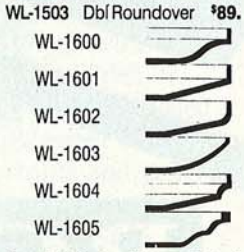
WL-1540	1/4"	$24.
WL-1541	3/8"	$26.
WL-1542	1/2"	$26.
WL-1543	3/4"	$28.
WL-1544	1"	$30.
WL-1545	1-1/2"	$32.
WL-1546	2"	$48.



WL-1500 WL-1501 WL-1502 WL-1503

SHAPER CUTTERS 3/4" BORE
1-piece Rail & Stile
Just raise the cutter to make the matching cut. No changing or reversing.

WL-1500	Roman Ogee	$89.
WL-1501	Roundover	$89.
WL-1502	Cove & Bead	$89.
WL-1503	Dbl Roundover	$89.



WL-1600
WL-1601
WL-1602
WL-1603
WL-1604
WL-1605

Panel Raisers (Shaper Cutter)
3/4" Bore

WL-1600	Ogee	$59.
WL-1601	15° Facecut	$59.
WL-1602	18° Traditional	$59.
WL-1603	Convex (Cove)	$59.
WL-1604	12° Facecut with Quarter Round	$59.
WL-1605	Wave	$59.

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ASK WOOD

Continued from page 92

Red or white cedar for outdoor furniture?

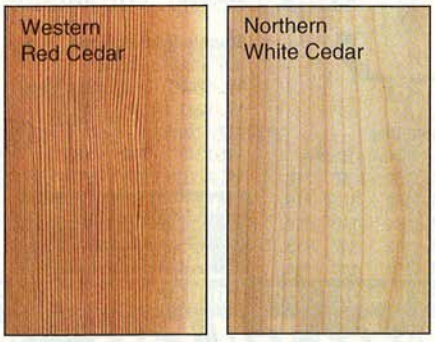
Many catalogs advertise outdoor furniture made of white cedar. Most of what I can get is western red cedar. Is either one good for outdoor furniture?

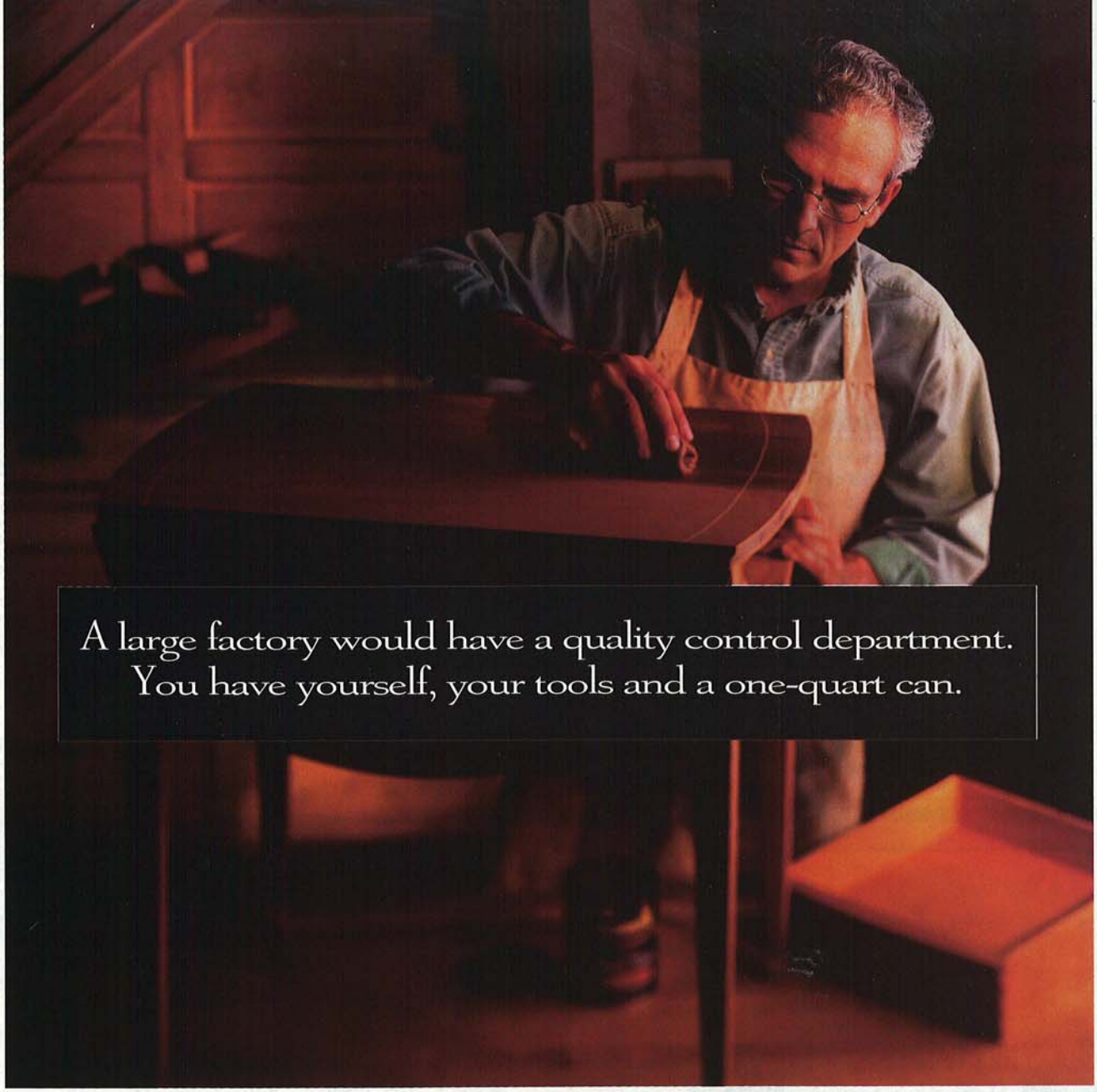
—Jim Gall, Bartlesville, Ohio

Both white cedar and western red cedar make excellent outdoor furniture, Jim, because both offer resistance to rot. You'll find them in log cabins, fencing, shingles, posts, decks, exterior siding, and boats. Similar in strength and easy to work with, either wood will give you years of maintenance-free service.

Western red cedar grows in the moist coastal forests from California to southern Alaska and in the Idaho and Montana mountains, too. Northern white cedar grows in a large range from eastern Manitoba and the lake states to New Brunswick and New York. Another species of white cedar, called Atlantic white cedar, grows from Maine south to Florida and west along the Gulf Coast to Louisiana. Western red cedar is slightly heavier and stronger than either white species, but not enough to make a difference in choosing wood for outdoor furniture. Use only the heartwood of either cedar; the sapwood does not resist decay.

We checked with the Forest Products Lab in Madison, Wisconsin, about the availability of white cedar. They tell us that most of the old-growth white cedar has been cut, so there aren't many large trees left. And much of what is grown is sold as soon as it gets large enough to be used as fence posts. Also, white cedar is not widely available outside of its growing ranges.





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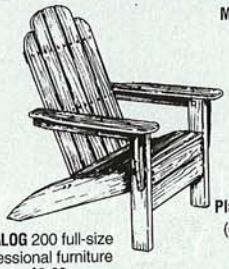

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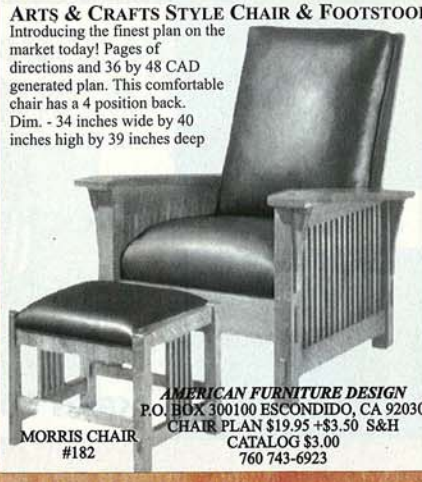

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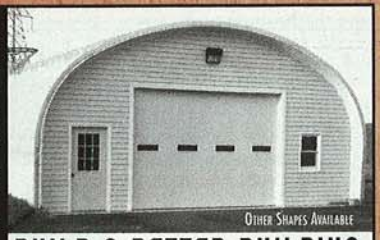

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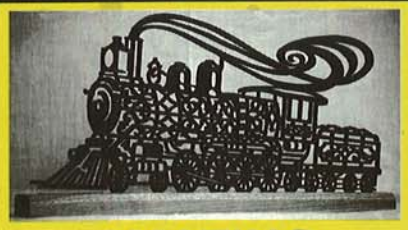

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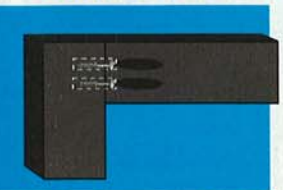

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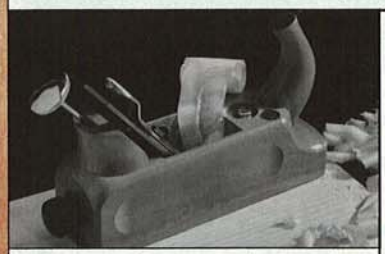

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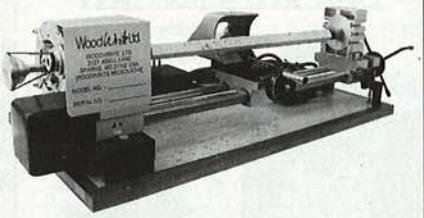

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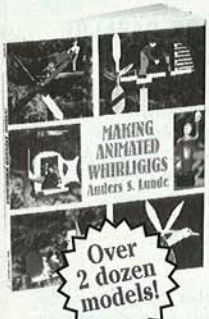

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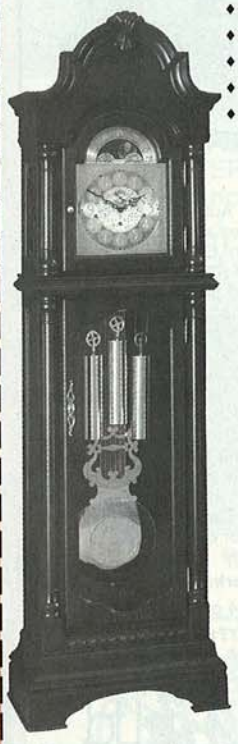

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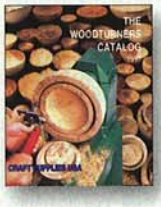

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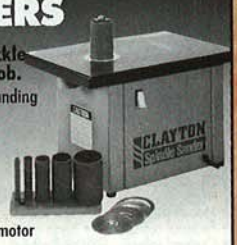

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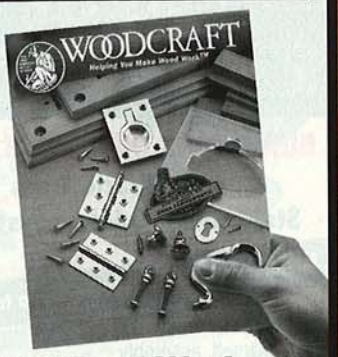

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NEW! *CDA250* **15G Cordless Angle Finish Nailer** $277.00
BN125 **18G** ¾"-1¼" Brad $87.90
BN200 **18G Brad Nailer Kit** .$124.00
DA250A **15G** 1¼-2" Finish ..$214.90
FN 250A **16G** ¾"-2" Finish ..$181.50
NS150 **18G** ½"1¼" **Crown Stapler** $136.90
FC350 **Clipped Head** 2"-3½" Framing Nailer Kit $287.00
FR350 **Full Round Head** 2"-3½" Framing Nailer Kit $287.00

693PK **1-1/2 HP Plunge Router Kit** includes 690 w/ fixed base & plunge base w/ case $188.00
690 1¼ **HP Router**....$142.00
691 1¼ **HP HDL Router** $159.00
6931 **Plunge Base Only** $82.00
6911 **D-Handle Base Only** ..$72.00
7539 3-1/4 **HP Plunge Router** - Plus Free Fine Depth Adjuster ($26.50 Value) $294.90
7518 3-1/4 **HP 5SP FB Router** $274.00
42000 **8 pc. Templet Guide Kit** $29.95
97310 **Laminate Trim Kit** ..$192.50
697 **Router Table** w/ 1½ H.P. Router $233.00
698 **Router Table** w/out motor $133.50
9862F **12V Cordless Drill Kit w/ Free Flashlight**....$158.90
9872 **14.4V Cordless Drill Kit** w/two batteries, case & charger $178.90
9872R **14.4V Recon Kit.** ...$158.90
9444 **Sander Kit** $103.50
330 **Speed Block Sander** ...$68.00
332 **5" QS Palm Sander** $59.90
333 **5" QS R/O Dst Sdr H&L** ..$63.90
333VS **VS R/O Palm Sander** $77.00
334 **5" QS R/O Dustless Sdr** $64.90
352VS **VS Belt Sander** ...$177.00
9352VS **VS Belt Sander w/ case** $188.90
7335 **5" VS R/O Sander** ...$139.00
97355 **5" VS R/O Sander** with Dust Collection & Case $149.00
552 **Prod. Pocket Cutter** ...$598.00
7800 **Drywall Sander** $348.80
362 **4x24 Belt Sander w/ Bag** $227.90
362VS **4 x 24 VS Belt Sander & Bag** $235.00
360 **3x24 Belt Sander w/ Bag** $224.00
360VS **3x24 VS Belt Sander & Bag** $227.00
347K **7-1/4 Circular Saw w/Case** $127.90
743K **L/H 7-1/4 Circular Saw w/ case** $127.90

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The top name in spray finishing is ready for your woodworking needs.
FLG-622-322 **HVLP Suction Gun** $159.95
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DELTA

12-1/2" Planer
BONUS: Free Extra Set of Planer Knives & Dust Chute!
Features: •Quick change knife system •Exclusive cutterhead-snipe control lock •Easy-to-read English and Metric scale.
#DEL 22-560P *List Price $568.00* **SALE.....$328.50**

30" Table Board CTE 2731 $23.90
52" Table Board CTE 2747 $28.90
Uni-Saws With Biesemeyer or Uni-fence
NEW! *36-800* **White Classic Edition Unisaw** w/50" Biesemeyer Fence $1599.00*
36-830 **3H.P.** w/30" Uni-fence ...$1399.00*
36-831 **3H.P.** w/30" Biesemeyer T-Square Fence$1399.00*
36-820 **3H.P.** w/52" Uni-fence (Special Edition)...$1499.00*
36-821 **3H.P.** w/50" Biesemeyer 52" T-Square Fence $1499.00*
34-182 **Tenoning Jig** $85.90
11-990 **5SP Drill Press** $192.00

14-650P **1/2 H.P. Hollow Chisel Mortiser** SUPER BONUS: w/ 4 Free Delta Mortise Chisels & Bits (1/4",5/16",3/8",1/2") $248.00

50-840P **1 HP 650 CFM Dust Collector** Includes Over $27.00 Value Free
•FREE 1-Delta 4' x 10' Dust Hose
•FREE 1-Delta Alum. Blast Gates
•FREE 2-Delta 4" Hose Clamps
SUPER BONUS BUY!
TOTAL PACKAGE ONLY $229.90

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•FREE 2-Delta Alum. Blast Gates
•FREE 4-Delta 4" Hose Clamps
SUPER BONUS BUY!
TOTAL PACKAGE ONLY $298.90
★ Price After Delta Rebate

NEW! *50-820* **Portable Dust Collector** $184.90
50-851 **2 HP 1200 CFM Dust Collector** $492.00
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37-350A **8" Jointer** w/stand $1337.90*
43-379 **Special Edition Shaper** $1335.00
43-505 **Router/Shaper** $297.90
50-345 **Universal Mobile Base** $48.40
31-280 **Sanding Center** $728.00*

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17-900 **16-1/2" Floor Drill Press** $344.00

New! DELTA New!

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NEW! *28-270* **Grand Edition White Band Saw** Includes Enclosed Stand, 18" White Rip Fence, Mobile Base and Cool Blocks $788.00*
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36-821L **Left Tilt UniSaw** Beismeyer Fence ...$1499.00*
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DELTA

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INCLUDES: 200 brads, 200 staples, oil, wrenches & case
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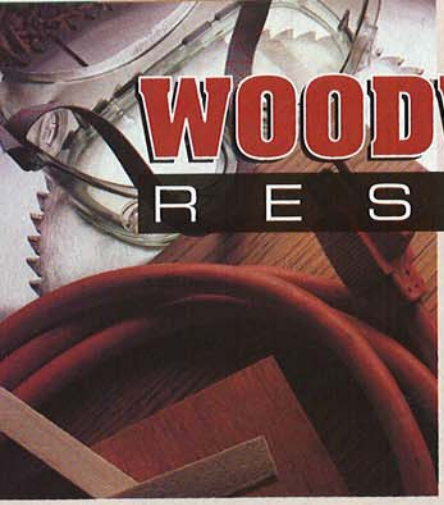

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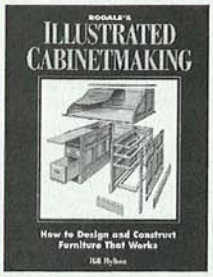

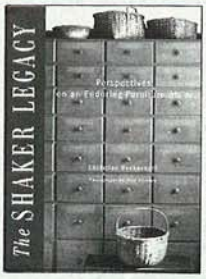

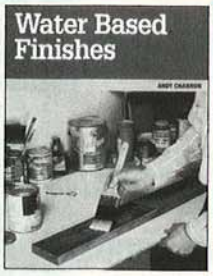

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1617EVS	2 hp electronic var. speed router	179
1618	1 3/4 hp D-handle router	169
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3294EVS	in line grip jig saw	122
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SC165VS	16" vs scroll saw	164

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C10FS	10" slide compound miter saw	558
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LU84R010	10" x 50T red combo blade	42
LU85R010	10" x 80T red crosscut blade	58
LU92M010	10" x 60 teeth TCH laminate	59
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LS1013	10" slide dual comp miter saw	558
LS1211	12" slide dual comp miter saw	668
N1900B	3 1/4" planer	146

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DW420	5" random orbit sander, psa	62
DW421	5" dstls rndm orb sander, velcro	67
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DW610	1 1/2 hp router, 9 amp	144
DW621	2 hp vs dstls plunge router	198
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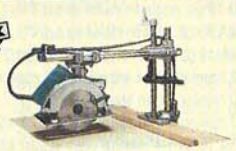

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CENTRAL MACHINERY

14" x 40" WOOD LATHE

Create beautifully turned pieces of furniture with this four speed lathe. Comes with chuck plate. Mount on your workbench.

Motor: 1/2 HP, 110V, 60 Hz, 5 amps; Swing over bed: 14"; Speed: 3010 RPM; Distance between center: 40"; Drive: V-belt; Overall size: 56-1/2" x 8-1/4" x 12-3/4"; Tool weight: 88 lbs.

~~$129.99~~ **$99.99**
ITEM 38515-1EJA

CENTRAL MACHINERY

MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Easier layout for professional mortise and tenon joints in furniture, cabinets, and restoration projects. Fence with hold down clamp keep workpieces from lifting off the table. Large capacity – up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.
10-7/8" x 7-3/4" base; 13-3/8" x 6" table; 3580 RPM spindle speed; 5" throat; 5" maximum workpiece height; Accepts .745" chisel shanks; 1/2 HP, 110V, 2.3 amps; 60 lbs. shipping weight

~~$169.99~~ **$149.99**
ITEM 35570-5EJA

DELTA®
Delta 22-540

12" PORTABLE PLANER

- Long lasting high speed steel, reversible, double edged knives
- Precise thickness scale conveniently located for easy reference
- Four precision ground columns to effortlessly raise and lower cutter head
- Includes removable table extensions, and fold away depth adjustment for easy transport
- Convenient carrying handles
- Factory reconditioned, factory perfect

26.2 FPM feed rate; Motor: 15 amp, 120V; Table size with extensions: 12-1/8" x 26"; Capacities: 12" width, 6" thick, 3/16" depth of cut; 8000 RPM, 16,000 CPM; 27-1/4" x 20-1/2" x 15" overall dimensions; 68 lbs. net weight

ITEM 06177-6EJA **$269.99**

NEW PLANER

ITEM 00258-6EJA **$299.99**

PLANER BLADES

ITEM 33075-3EJA **$29.99**

CENTRAL MACHINERY

INCLUDES STAND

6" INDUSTRIAL RABBETING JOINTER

- Infeed table size: 22-1/2"
- Outfeed table size: 19-1/2"
- Motor: 1 HP, 110V, 4 amp, 4900 to 5900 RPM cutter head speed
- Maximum depth of cut: 3/8"

~~$279.99~~ **$199.99**
ITEM 30289-4EJA

REPLACEMENT BLADE SET

ITEM 38268-0EJA **$9.99**

CENTRAL MACHINERY

25" RIP CAPACITY

10" INDUSTRIAL TABLE SAW

Die cast aluminum table 26" x 16" has adjustable 17-7/8" x 2" rip fence. Anit-kickback fingers and see-through blade guard for safety.

- Maximum depth of cut @ 90°: 3-1/8"; @ 45°: 2-1/2" • Shipping wt.: 36 lbs.
- Miter gauge adjusts 0° – 60° left & right
- Motor: 2HP, 115V, 60 Hz, 10 amp, 4500 RPM • Blade sold separately

ITEM 38533-1EJA **$79.99**

10" 40 TOOTH CARBIDE TIP SAW BLADE

Resharpenable precision ground tips; 5/8" arbor

ITEM 00529-4EJA **$9.99**

4154

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RYOBI Ryobi R160K

LIMITED QUANTITIES

1-1/2 HP ROUTER

- 25,000 RPM • 8 amps @ 120V
- All ball bearing motor • 1/4" collet
- Includes spindle lock and wrench storage
- Factory reconditioned, factory perfect

ITEM 51782-2EJA **$45.99**

5 PC. STRAIGHT ROUTER BIT SET

- Carbide tips • 1/4" shanks
- Includes: 1/4", 3/8", 1/2", 5/8" and 3/4" straight bits (2 flutes)

$9.99

ITEM 38357-1EJA

CENTRAL MACHINERY

DOVETAIL MACHINE

Just place stock and pull the cam handles to positively lock material in place. Allows cutting tails, pins, half blind, and standard dovetails. Accepts stock up to 12" wide and 1-1/4" thick. Includes 1/2" template.

~~$59.99~~ **$49.99**

ITEM 34102-4EJA

CENTRAL MACHINERY

16" SCROLL SAW

- Precision milled 14-1/2" x 8" cast aluminum table tilts 0° to 45° left
- Uses pin end blades, 5-1/2" long
- Heavy duty cast iron frame and base reduce vibration
- 1/8 HP, 110V, .83 amps
- 1750 SPM blade speed
- 7/8" blade stroke
- Single speed

ITEM 37908-2EJA **$49.99**

FOOT SWITCH WITH GUARD

Ready to use. Steel housing and 8 ft. cord.

ITEM 37784-1EJA **$9.99**

CENTRAL MACHINERY

12" DIRECT DRIVE BENCH TOP DISC SANDER

Get sharp, accurate finishes without burning or marring. Direct drive disc won't slip. Table tilts to 45°; 2" dust collection outlet; fan-cooled brushless motor; miter gauge, base pads prevent creeping; safety switch. Includes 60 grit, 12" sanding pad.

- 1 HP, 120V, 10 amps
- No load speed: 1793 RPM
- Wheel diameter: 12" • Base: 13" x 10"
- Shipping wt.: 92 lbs.

ITEM 37297-3EJA **$89.99**

Pittsburgh

Pittsburgh LIFETIME WARRANTY

2 PC. 3/4" HEAVY DUTY PIPE CLAMP

Constructed from heat-treated cast iron, these durable clamps keep your work rock steady. Just screw the handle side onto a 3/4" threaded pipe and slide the spring loaded end on. You're ready to go! Pipe not included.

- Handle screw operating range: 2-1/8"
- 1-1/2" throat depth
- Weight: 2-7/16 lbs.

ITEM 31255-1EJA **$3.99**

1/2" PIPE CLAMP

- 1-1/2" throat depth
- Weight: 1-4/5 lbs.

ITEM 37056-2EJA **$2.99**

FINEST HARDWOOD

SOLID HARDWOOD WORKBENCH

Includes large flush mounted vises. Twin rows of 10 bench dog holes hold just about any project. Tools shown sold separately.

- 2 vises: 13"W x 1-1/4"D x 7-1/2"L max.
- Trough: 47-3/8"L x 5-1/2"W x 2-3/4"D
- Overall: 55"L x 25"W x 32-3/4"H
- Work area: 49-1/4" x 13-1/2"
- 20 bench dog holes
- Weight: 64 lbs.

ITEM 01635-0EJA **$99.99**

CHICAGO Electric Power Tools

3/8", 18 VOLT CORDLESS DRILL/DRIVER

WITH KEYLESS CHUCK

More run time than 14V cordless drills. Balanced T-handle design keeps the drill steady. Heavy duty motor.

6 pc. screwdriver, 6pc. drill bit set; Includes charger, 18V battery, and carrying case; Speed range: 0-900 RPM; 3/8" *Jacobs*® keyless chuck; Variable speed reversible; 6 torque clutch settings

~~$72.99~~ **$59.99**

ITEM 37144-4EJA

18V REPLACEMENT BATTERY

~~$37.99~~ **$29.99**

ITEM 37145-1EJA

CENTRAL MACHINERY

6" x 12" MINI WOOD LATHE

Create projects from miniature to full-size. Heavy duty, cast iron construction for minimum vibration and high strength. Light weight and compact size allow bench top mounting or taking it on the job. Dual speed range for absolute cutting control.
Distance between centers: 12-1/2"; 3-1/8" wide tool rest with adjustable height; 120V, 60 Hz, 3.2 amp motor; MT1 spindle; Swing over bed: 6"; 25"L x 4-3/4"W x 9-1/2"D; Speed range – Low: 275 to 3050; High: 400 to 4450

~~$179.99~~ **$139.99**

ITEM 34837-7EJA

CHICAGO Electric Power Tools

VARIABLE SPEED RECIPROCATING SAW

- Gear driven, variable speed
- 1-1/4" stroke • 3.6 amps
- 600 Watts • All ball bearing
- 300 SPM to 2400 SPM
- 110V, 60 Hz, single phase
- Overall length: 17"
- Tool weight: 7-1/4 lbs.

ITEM 36595-6EJA **$39.99**

RECIPROCATING SAW BLADES

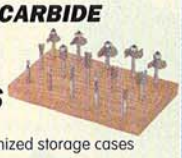
LIMITED QUANTITIES

Grab bag selection of saw blades for your reciprocating saw. Contents vary for each package.

PACK OF 5 **$1.99**

ITEM 36340-4EJA

TUNGSTEN CARBIDE TIPPED ROUTER BIT SETS



- 1/4" shanks
- Individually organized storage cases

15 PC. ASSORTED BITS

1-1/4" rabbeting♦, 1-3/8" cove♦, 1-1/16" roman ogee♦, 1-1/4" rounding over♦, 1/2" flush trimming♦ 1-3/16" 45° chamfer♦, 1/2" dovetail, 3/4" straight, 1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising, 1/4" cove, 1/8" straight. ♦Includes pilot bearing

ITEM 31164-5EJA **$29.99**

4 PC. ROUNDING OVER BITS

• 1-5/32" long shanks • 2 flutes each
Sizes: 1/8", 1/4", 3/8" and 1/2" with pilot bearing tips

ITEM 33078-7EJA **$15.99**

CENTRAL MACHINERY

BENCH TOP SHAPER/ROUTER

Expand your workspace with this handy wood shaper. Big machine features and compact enough to store under your bench. Very advanced – accepts both shaper cutters and router bits for the exact finish you want.

- Uses 2" diameter shaper cutters and router bits with 1/4" shank
- Individually adjustable fence halves
- 115V, 4.3 amps, 7/8 HP
- 10,200 RPM motor speed
- Cast iron work table and base
- Rear chip discharge

~~$109.99~~ **$89.99**

ITEM 32650-0EJA

CHICAGO Electric Power Tools

1/2 PRICE

HEAVY DUTY 4-1/2" DISC GRINDER

- 5/8"-11 spindle with 7/8" arbor adapter
- Motor: 3/4 HP, 115V, 5.18 amps
- Spindle lock • 11-7/8" long
- High powered 10,000 RPM

~~$39.99~~ **$19.99**

ITEM 31135-6EJA

4-1/2" x 1/4" GRINDING WHEELS

- 24 grit, 7/8" arbor

FOR	ITEM	10 PACK
Metal	06674-0EJA	$8.99
Masonry	07422-2EJA	$8.99

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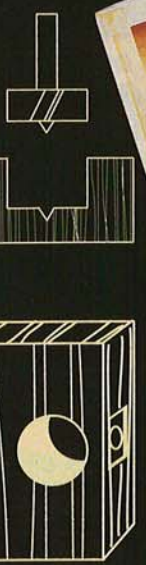
FORSTNER BIT SPECIAL!



TOP QUALITY PRODUCT!

These bits are the most accurate and versatile of all wood bits. They cut extremely smooth and clean flat-bottomed holes in all kinds of wood, even in thin stock or veneers. All bits have ⅜" shank and are 3½" long. Consists of 16 pieces, one of each size from ¼" - 2⅛" in ⅛" increments. Includes wooden box.

G1673 16-pc Forstner Bit Set

REG. $59.95 SALE PRICE $39.95

G7931 16-pc TiN Forstner Bit Set

REG. $79.95 SALE PRICE $49.95

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DELTA TOOLS

Model	Description	List	Sale
31-750	NEW Bench Random Orbit Sander	Sale	199
28-150	NEW 9" Bench Band Saw	Sale	155
50-860	NEW 850 CFM Air Cleaner	Sale	239
31-695	6" Belt/9" Disc Sander	441	299
23-710	Sharpening Center	217	145
31-460	4" Belt/Disc Sander	198	119
40-560	16" 2 speed Scroll Saw	230	129
40-540	16" var/spd Scroll Saw	249	165
11-990	12" Bench Drill Press	255	184
11-090	32" Radial Bench Drill Press	405	279
43-505	1/2" Bench Router/Shaper	398	269
22-540	12" Bench Top Planer	Sale	259
28-195	10" Band Saw	390	309
22-560	12-1/2" Planer w/ extra knives	329	
36-865	Versa Feeder Stock Feeder		249
36-220	10" Compound Mitre Saw	294	199
28-185	Bench Band Saw	213	168
36-240	10" Sliding Mitre Saw	589	439
37-070	6" v/spd Bench Jointer	351	265
14-650	Hollow Chisel Mortiser	380	249
17-900	16-1/2" Floor Drill Press	490	329
17-920	NEW Mortise Chisel Kit	Sale	59
36-285	8-1/4" Builders Saw w/ stand	Sale	268
34-555	Sliding Table	487	289
36-250	10" Slide Compound Saw	825	449
31-780	Oscillating Spindle Sander	253	194
31-780K	31-780 w/ 31-781 spindle set		209
46-700	12" Wood Lathe	575	465
40-650	Q3 18" Scroll Saw	Sale	389
36-905	30" Unifence	346	255
36-906	50" Unifence	444	299
36-444	10" Contractors Table Saw	Sale	579

The following tools have a $50.00 rebate ! Price shown is before rebate. Rebates valid thru 3/31/99.

36-455	10" Contractors Table Saw w/ 30" unifence, cast iron wing, 34-914 table board, & carbide blade	Sale	849
22-675	DC380 15" Planer	Sale	1175
28-275	14" Band Saw 3/4 HP	Sale	595
28-280	14" Band Saw 1 HP motor with enclosed stand	Sale	739
28-270	14" Band Saw 1 HP w/ 50-274 mobile base, 28-855 rip fence, & 28-266 cool blocks	Sale	839
31-280	Sanding Center w/ stand	Sale	789
37-190	6" Deluxe Jointer	603	445

NEW Single Stage Dust Collectors

50-850	1-1/2 HP, 1200 CFM	Sale	285
50-851	2 HP, 1500 CFM	Sale	489

MILWAUKEE TOOLS

6527	NEW Sawzall with case	343	169
6537-22	6527 w/quick lok blade change	224	175
0407-22	12V Drill w/kyls chuck&2 batt	380	175
0224-1	3/8" Drill 4.5 amp magnum	236	132
0234-6	1/2" Drill 4.5A mag 0-850 rpm	255	134
0235-1	1/2" Drill w/keyless chuck	255	139
0244-1	1/2" Drill 4.5A mag 0-600 rpm	255	134
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	213	119
0228-6	3/8" Drill 3.5 amp 0-1000 rpm	207	109
0375-1	3/8" close quarter Drill	255	148
0379-1	1/2" close quarter Drill	288	165
6546-6	Screwdriver 200 & 400 rpm	150	89
6547-6	6546-6 w/bits,1/4" chuck & cs	185	108
5399	1/2" D-hdle Hammer Drill Kit	356	219
5397-1	3.8" w/ spd Hammer Drill Kit	275	145
5371-6	1/2" v/ spd Hammer Drill Kit	360	194
3107-6	1/2" v/spd right angle Drill Kit	411	234
6142	4-1/2" Grinder w/cse & acc.	224	129
6490-6	10" Mitre Saw	496	265
6491	6490 w/ carbide blade & bag	594	345
6494-6	10" Compound Mitre Saw	585	319
6266-6	Top Handle Jig Saw	315	159
6496-6	10" Slide Compound Saw	1050	569

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item	Description	Teeth	List	Sale
LU72M010	Gen Pur. A.T.B.	10" 40	69	42
LU82M010	Cut-off	10" 60	93	29
LU84M011	Comb	10" 50	78	45
LU85R010	Super Cut-off	10" 80	115	64
LM72M010	Ripping	10" 24	69	38
LU73M010	Cut off	10" 60	84	49
LU87M010	Thin Kerf	10" 24	72	45
LU88M010	Thin Kerf	10" 60	88	49
LU98M010	Ultimate	10" 80	128	68
LU91M010	Compnd Mitre	10" 60	88	54
F410	Quiet Blade	10" 40	95	49
SD308	8" Dado - Carbide		230	119
SD508	8" carbide w/case & shims		344	172
FB100	16 piece Forstner Bit Set		338	194
94-100	5 pc. Router Bit Door System		320	169
FT2000E	Plunge Router		Sale	189

HITACHI TOOLS

C8FB2	8-1/2" Slide Compound Saw	1169	449
C10FS	10" Slide Compound Saw	1627	579
C15FB	15" Mitre Saw	1346	645
NV45AB	Coil Roofing Nailer	935	379
NT32AE	NEW Pinner 5/8" - 1-1/4"	Sale	85
NT50AE	NEW Pinner 3/4" - 2"	Sale	129
C10RA	NEW 10" Table Saw	632	319

MAKITA TOOLS

Model	Description	List	Sale
5090DW	3-3/8" Saw Kit 9.6 volt	280	155
DA391D	3/8 angle Drill 9.6V	166	114
DA391DW	3/8" angle Drill Kit 9.6V	341	175
ML902	Incandescent Flashlight 9.6V	14.95	
6095DWE	9.6 volt Drill Kit w/2 batt	Sale	125
6095DWLE2	6095DWE w/flashlight	Sale	139
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28

NEW 18 VOLT MAKITA TOOLS

6343DWAE	1/2" Drill Kit	Sale	249
5620DWA	6-1/2" Circular Saw Kit	Sale	259

CORDLESS DRILLS WITH 2.0 AMP HIGH CAPACITY BATTERIES

6213DWAE	12V 3/8" Drill Kit	325	169
6233DWAE	14.4V 3/8" Drill Kit	358	205
9900B	3"x21" Belt Sander w/bag	347	165
9924DB	3"x24" Belt Sander w/bag	360	169
N1900B	3-1/4" Planer with case	263	142
1912B	4-3/8" Planer	352	205
N9514B	4" Disc Grinder 4.6 amp	118	65
DA3000R	3/8" Angle Drill	355	185
2708W	8-1/4" Table Saw	637	295
6405	3/8" Drill Rev. 0-2100 rpm	115	65
6013BR	1/2" Drill Rev. 6 amp	270	159
9401	4" x 24" Belt Sander w/bag	458	219
5007NBK	7-1/4" Circ Saw w/ case	250	125
LS1011	10" Slide Compound Saw	995	429
LS1211	12" Slide Compound Saw	1620	695
3901	Plate Joiner Kit	376	159
3612C	3 HP Plunge Router	492	249
LS1040	10" Compound Miter Saw	460	259
LS1013	10" Dual Compound Slide Miter Saw	1088	599
BO5010	5" Random Orbit Sander	142	72
LS1220	NEW 12" Compound Miter Saw	379	
9227C	NEW 7/9" Polisher	350	195
SJ401	NEW 16" Bench Scroll Saw	300	175
2702	NEW 8-1/4" Table Saw	Sale	299
2703	NEW 10" Table Saw	Sale	319

SENCO AIR NAILERS

SFN1+	Finishing Nailer 1 - 2" w/ cs	448	225
SN325	Nailer 1-7/8 - 3-1/4"	665	365
SLP20	Pinner w/cs 5/8 -1-5/8"	422	185
SKS	Stapler 5/8 - 1-1/2"	390	245
SN70	Framing -Clip Hd 2 - 3-1/2"	725	449
SN65	Framing -Full Hd 2 - 3-1/2"	709	379
SN600	NEW Framing 2 - 3-1/2"	699	369
SFN40	Finish Nailer 1-1/4 - 2-1/2	569	319

NEW Accuset Nailers by SENCO

A100LS	Finish Stapler 1/2" - 1"	180	119
A150LS	Finish Stapler 1/2" - 1-1/2"	220	149
A125BN	Brad Nailer 5/8" - 1-1/4"	160	99
A200BN	Brad Nailer 5/8" - 2"	215	139

BOSTITCH AIR NAILERS

Model	Description	List	Sale
N80S-1	Stick Nailer	Super Sale	325
RN45	Coil Roof Nailer 3/4 - 1-3/4	845	359
N60FN-2K	Finishing Nailer w/ case	557	269
BT35-2K	Brad Tacker 5/8" - 1-3/8" with case, oil, & brads	279	125
MIIIFS	Flooring Stapler 15 gauge	902	529
S32SX-1K	Finish Stapler-1/2" - 1-3/8" with case & oil	269	145

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Opening Capacity	List	Sale	Box of 6
#0	8"	4-1/2"	20.35	12.10	66.95
#1	10"	6"	23.30	12.90	71.95
#2	12"	8-1/2"	26.75	14.90	83.95
#3	14"	10"	33.85	18.55	105.75

PONY CLAMP FIXTURES

Model	Description	List	Sale	Lots of 12
50	3/4" Black Pipe	15.45	8.50	92.50
52	1/2" Black Pipe	12.65	6.95	74.95

PANASONIC CORDLESS

EY6100FQKW	12V 3/8" Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379	179
EY6230FQKW	NEW 15.6V Drill Kit with 2 Ironman batteries, 30 minute charger & case	425	209
EY3503FQWKW	5-3/8" 12V Wood Cutting Circular Saw Kit	500	259
EYC001	EY6100FQKW drill, EY3503FQW saw, 2 batteries, 15 minute charger, and case	Sale	315

BIESEMEYER FENCES

B-50	50" Commer. Saw	443	325
T-SQUARE 52	52" Homeshop	360	275
T-SQUARE 40	40" Homeshop	335	255
T-SQUARE 28	28" Homeshop	325	245

AIRY AIR NAILERS

Model	Description	List	Sale
0241SK	Brad Nailer 3/8" - 1-9/16"	180	98
0626SK	1/4" Crown Stapler 3/8" - 1"	194	98

Above nailers come w/case, fasteners, oil & wrenches

0241/0626
0241 Brad Nailer, 0626 Stapler, case, fasteners, oil, & wrenches
Super Sale 129.95

STABILA LEVELS

25010	10" die cast Torpedo Level	43	19
24640	24" Level w/ hand holes	62.20	43
24670	48" Level w/ hand holes	79.70	58

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DEWALT TOOLS

Model	Description	List	Sale
DW309K	Recipro Saw 10 amp	318	175
DW378G	7-1/4" Framer's Saw	210	169
DW222	3/8" Drill, 0-1200 rpm	184	99
DW231	1/2" Drill, 0-850 rpm, 7.0 amp	240	129
DW236	1/2" Drill, 0-850 rpm, 7.8 amp with keyless chuck	264	149
DW124K	1/2" right angle Drill	590	329
DW321K	Top Handle Jigsaw Kit	300	164
DW364	7-1/4" Circ. Saw w/brake	294	162
DW610	1-1/2 HP 2 handle Router	266	149
DW411K	1/4 sheet Palm Sander w/ cse	88	58
DW682K	Biscuit Joiner with case	448	169
DW705	12" Compound Mitre Saw	734	359
DW621	2 HP Plunge Router	400	218
	DW621 comes with Free DW6956 fine height adjuster !		
DW675K	3-1/8" Planer with case	292	164
DW677K	3-1/4" Planer w/ case	268	155
DW431	3 x 21 v/spd Belt Sander	338	188
DW421	5" Palm Ran. Orb Sander	144	74
DW423	Palmgrip Random Orbit Sander - variable speed	170	94
	DW421 & DW423 come with Free DW4317 case !		
DW673K	Laminate Trimmer Kit	364	188
DW272	Drywall Gun, 0-4000, 6.3 amp	160	95
DW276	Drywall Gun, 0-2500, 6.5 amp	160	95
DW935K	14.4V 5-3/8" Trim Saw Kit	444	237

DEWALT CORDLESS DRILLS

DW952K-2	3/8" v/spd w/ two 9.6V XR batteries	284	129
DW972K-2	3/8" variable speed w/ two 12V XR batteries	362	184
DW972KQ-2	Above drill kit with 15 minute charger	Sale	229
DW991K-2	3/8"variable speed w/ two 14.4V XR batteries	415	209
DW991KQ-2	Above drill kit with 15 minute charger	Sale	245
DW994KQ	1/2" variable speed w/ one 14.4V XR batteries	458	239
	Above drill kits come w/ charger & steel case !		
DW991KS-2	DW991K drill, DW935 trim saw, 2 XR batteries & case	Sale	345

DEWALT 18 VOLT CORDLESS TOOLS

DW938K	Recipro Saw Kit	520	269
DW995K	1/2" Drill Kit w/ 1 battery	428	229
DW995K-2	1/2" Drill Kit w/ 2 batt.	Sale	249
DW997K	1/2" Drill/Hammer Drill Kit	454	249
DW936K	5-3/8" Saw Kit	458	249
DW995KS-2	DW995K Drill, DW936 Saw and case	Sale	385
DW991KC-2	DW991K 14.4V drill kit, DW937 14.4V recipro saw,& case	375	
DW995KC-2	DW995K 18V drill kit, DW938 18V recipro saw, & case	395	
DW997KC-2	DW997K 18V drill kit, DW938 18V recipro saw, & case	419	

DEWALT BENCH TOP TOOLS

DW708	12" Dual Compound Slide Mitre Saw	Sale	649
DW788	20" Scroll Saw	Sale	469
DW733	12" Planer w/ extra blades	Sale	435
DW744	10" Portable Table Saw	Sale	499
DW756	NEW 6" Bench Grinder	164	75
DW758	NEW 8" Bench Grinder	184	115

BOSCH

Model	Description	List	Sale
1587VS	Top Handle "CLIC" Jig Saw	292	139
1587AVSC	1587VS Saw Kit with case and *New* Progressor blades	Sale	149
1584VS	Barrel "CLIC" Jig Saw	288	149
	Bosch Metal Case for above Jig Saws		24
	Bosch 30 blade assortment for Jig Saws		29.99

1584VS or 1587VS
with steel case and 30 Bosch blades **Sale 175**

1295DH	5" Random Orb Palm Sndr	145	89
1274DVS	3"x21" v/spd Belt Sander	301	175
1278VSK	1-1/2"x12" Belt Sander	218	129
1275DVS	3"x24" v/s Belt Sndr	379	214
1276DVS	4"x24" v/s Belt Sndr	408	229
1194VSR	1/2" v/ spd Hammer Drill	272	155
1194VSRK	above Drill w/ case	303	169
1613EVS	2HP v/s Plunge Router	369	199
1615EVS	3 HP v/s Plunge Router	536	305
1634VSK	Recip Saw 10.5 amp	335	185
3315K	12V T-handle Drill Kit	345	159
3615K	14.4V Drill Kit	354	174
3107DVS	5" Random Orbit Sander	165	98
3107DVSK	3107DVS with case	195	115
3725DVS	5" Random Orbit Sander	256	145
3727DVS	6" Random Orbit Sander	266	149
3915	10" Slide Compound Saw	1050	499
3912	NEW 12" Compound Mitre Saw	638	359
1224VSR	7/8" SDS Rotary Drill	404	229
1703AEVS	5" Grinder - 8.5 amp	245	139

Introducing the NEW Bosch Routers

1617	1-3/4 HP Router - 2 handle	Sale	169
1617EVS	2 HP Router w/ variable speed - 2 handle	Sale	189
1618	1-3/4 HP Router - "D" handle	Sale	179

JDS AIRTECH AIR CLEANERS

Model	Description	List	Sale
750	12"x24"x28" 1/4 hp 200 CFM - 750 CFM	Sale	249
8-12	20"x24"x44" 1/3 hp 800 & 1200 CFM	Sale	479

RYOBI SPECIALS

RE600	3 HP Plunge Router w/spd	500	235
BE321	3" x 21" v/spd Belt Sander	310	139
	Above sander comes with sanding frame		
WDS1600	16" x 32" Drum Sander	980	569
	Above sander comes with stand		
JM80K	Plate Jointer with case	218	99

JET TOOLS

JJ60S	6" Jointer - open stand	Sale	429
JJ6CSX	6" Anniversary Jointer - closed stand w/ extra knives	Sale	499
JJ8CS	8" Jointer - closed stand	Sale	1189
JWP124P	12" Benchtop Planer	Sale	299
JWBS14OS	14" Band Saw 3/4 HP - open stand	Sale	499
JWBS14CSW	14" Anniversary Band Saw - 1 HP - closed stand, rip fence and mitre gauge	Sale	569
JWTS10JF	10" Contractor Table Saw with 30" Jet fence 1-1/2 HP	Sale	549
JWTS10CWPF	10" Contractor Table Saw with 30" Exacta fence 1-1/2 HP	Sale	749
JTAS10X50W1	10" Anniversary Tilting Arbor 3 HP Table Saw with 50" Exacta fence, table, & legs	Sale	1399
JDP17MFW	16-1/2" Anniversary Drill Press 3/4 HP - 16 speed with mortise attachment & bit set	Sale	439
DC-650	Dust Collector, 1 HP, 650 CFM	319	219
JWP-15HO	15" Planer with sand	1699	1229

PORTER CABLE

9444	Profile Sander Kit	220	99
9444VS	Var/spd Profile Sander Kit	207	119
690	1-1/2 HP Router 8 amp	278	149
6931	Plunge Router Base	139	82
693PK	690 and 6931 plus case	Sale	199
9690	690 Router with case	Sale	159
691	1-1/2 HP Router D-handle	303	164
693	1-1/2 HP Plunge Router Base	338	184
697	1-1/2 HP Router/Shaper	418	235
698	Heavy Duty Shaper Table	238	135
352VS	3x21 v/s Belt Sander w/bag	321	175
9352VS	Above sander with case	Sale	189
360	3"x24" Belt Sander w/ bag	397	214
360VS	360 Sander w/ variable speed	429	229
362	4"x24" Belt Sander w/ bag	412	225
362VS	362 Sander w/ variable speed	446	239
9125	3-1/4" Planer Kit w/ case	250	145
505	1/2 sheet Pad Sander	249	139
330	Speed Block Sander 1/4 sheet	120	68
556	Biscuit joiner w/5556 fence	Sale	135
557	Plate Jointer with tilt fence. Includes 2" & 4" blades for use with standard & face frame plates	400	199
5563	Face frame plates for 557		7.99
7519	3-1/4 HP Router 2 Handle	469	258
7518	3-1/4 HP 5 speed Router	534	289
7539	3-1/4HP v/spd Plunge Router	534	289
7310	5.6 amp Laminate Trimmer	176	104
97310	Laminate Trimmer Kit comp	336	194
7335	5" Random Orbit Sander	254	139
97355	7335 w/ case & dust pick-up	274	149
7336	6" Random Orbit Sander	259	145
97366	7336 w/ case & dust pick-up	284	159
332	Palm Grip Rndm Orb Sander	133	59
333	above sander with dust bag	148	65
333VS	NEW Random Orbit Sander - variable speed	150	85
334	333 Sander with PSA pad	148	65
335	Palmgrip Random Orbit Sander with dual flip pad	Sale	85
310	Production Lam. Trimmer	270	154
347K	7-1/4" "Framers" Circ Saw with plastic case	250	129
743K	7-1/4" "Framers" Circ Saw with case - left hand version	250	129
9737	Tiger Recipro Saw	307	159
9543VS	NEW Top Handle Jig Saw	300	169

New Porter Cable Cordless Nailers !

CDA250	Angle Finish Nailer 1-1/4" to 2-1/2"	500	279
CFN250	Finish Nailer 1" to 2-1/2"	500	279
CMS200	Medium Crown Stapler 1" to 2"	500	279

Porter Cable Pneumatic Nailers

BN125	Brad Nailer -18 ga. 5/8"- 1-1/4"	144	89
BN200	Brad Nailer -18 ga. 3/4"-2"	238	125
FN250A	Finish Nailer -16 ga. 1"-2-1/2"	362	185
DA250A	Nailer -15 ga. 1-1/4"-1-1/2"	412	215
FC350	Framing Nailer - clipped head	558	289
FR350	Framing Nailer - round head	558	289
RN175	Roofing Coil Nailer	504	289

CFBN125 BN125 nailer, CF1400 compressor and 25' air hose
Sale 269.00

Porter Cable Compressors

CF1400	1 HP, 4 gal. Pancake	Sale	195
CF1540	1-1/2 HP, 4 gallon Side Stack	Sale	299
CF2400	2 HP, 4 gal. Side Stack	Sale	325

Porter Cable Cordless Drills

9862	12V Drill Kit w/ 2 batteries	382	159
9862F	9862 Drill Kit with flashlight	Sale	169
9872	14.4V Drill Kit w/ 2 batteries	424	185

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Kip Christensen holds a small container he turned from the part of an elk antler called the burr or rosette.

Utah turner prefers elk

Kip Christensen has been woodturning for 20 years with traditional woods, including burls. As an associate professor in Brigham Young University's technology education program, he teaches students how to work wood. But in his home shop in Provo, Utah, he prefers working with elk antler. "Antler has been used as a craft medium for centuries, but little has ever been done with it on the lathe," he says.

Kip has turned antler other than elk. But according to him, deer proves too small, and moose isn't colorful enough. So he uses the round mass at the base of a rack of elk antlers, known as the burr or rosette, to make small bowls and lidded containers. "The material has many of the same visual qualities as tree burl—irregular grain patterns and swirling colors," he notes. "And I can use standard chisels and gouges."

Elk naturally shed their antlers annually and grow new ones. That means Kip can look for them in the wild, buy racks from craft companies, or deal directly with elk ranches where the animals are commercially raised for meat, hide, and antlers.

In this close-up view, you can see that the 5"-diameter, lidded container of elk antler has a natural edge, turquoise trim, and a finial made from padauk.

Get a load of this mega mesquite!

Uvalde, Texas, craftsman Robert Hensarling builds rockers of mesquite (see *page 45*), usually a small tree that yields very little clear wood. So you can imagine his surprise when he came across the huge mesquite tree that produced the 36"-diameter, 12'-long log shown between him and *WOOD*® magazine's features editor, Pete Stephano, *below*.

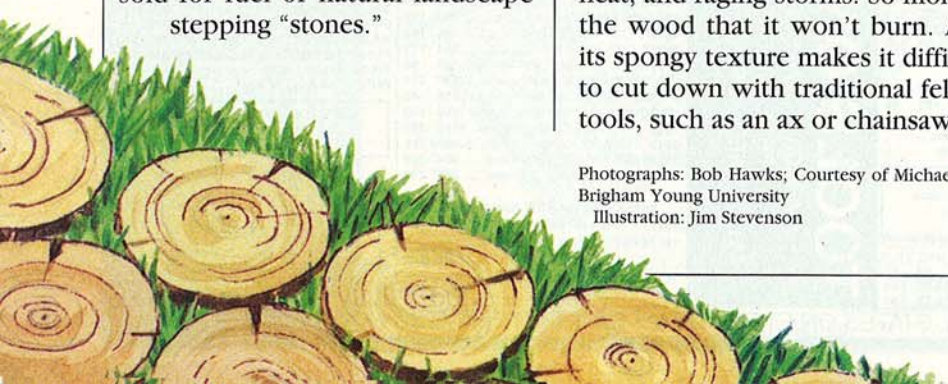
"A local rancher called and said he was going to bulldoze some mesquite to make room for cattle grazing. I could have it if I hauled it away. But I never expected to find this," Robert says of the log, which contains about 500 board feet of wood, much of it burled. "It took a big log loader and a huge flatbed trailer to get the log to my shop and stood up. For now, I'm just keeping it around as an oddity."

Robert holds the record for the largest piece of furniture ever made from mesquite—a 17'-long conference table. This log should keep his name in the Texas record book, when he decides what he'll make.

Texas woodworker Robert Hensarling, *left*, and features editor Pete Stephano relax next to what may be the largest mesquite log ever harvested.

Lily pads from the woods

In the logging industry, "lily pads" is the name given to the round sections cut off the butt end of logs to smooth them up. They're often sold for fuel or natural landscape stepping "stones."



Death-defying tree

In Argentina grows a tree that's really not good for anything but shade. Yet, the ombu tree is one of the world's hardiest. It survives with little water, resists insects, heat, and raging storms. So moist is the wood that it won't burn. And its spongy texture makes it difficult to cut down with traditional felling tools, such as an ax or chainsaw.

Photographs: Bob Hawks; Courtesy of Michael Smart, Brigham Young University
Illustration: Jim Stevenson

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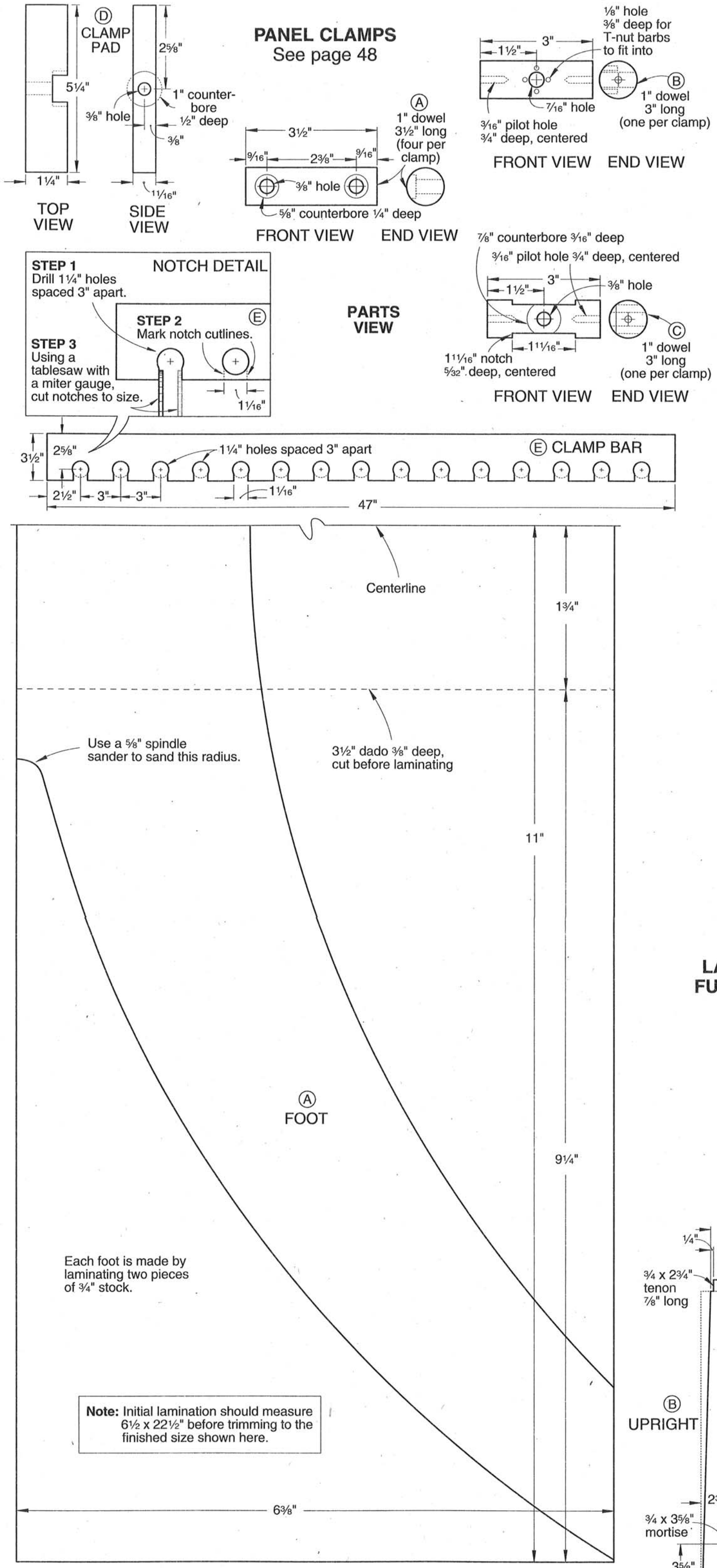
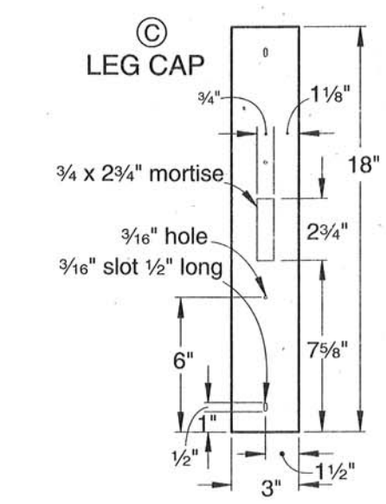
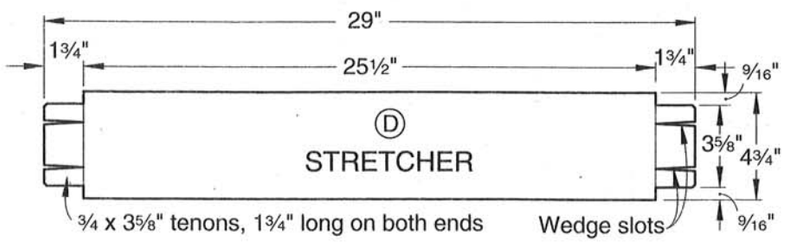
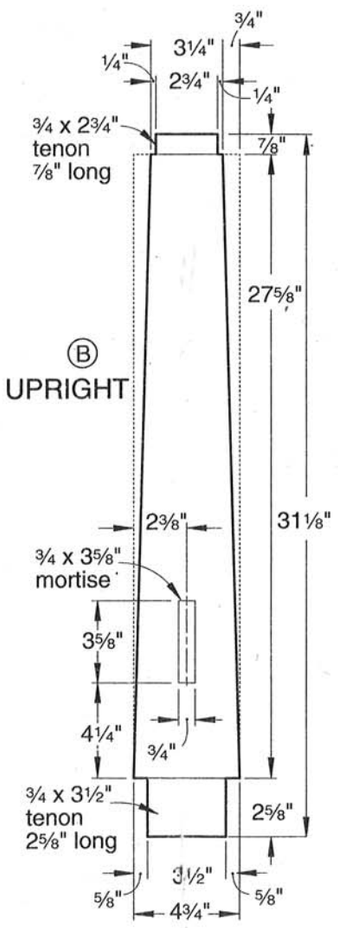


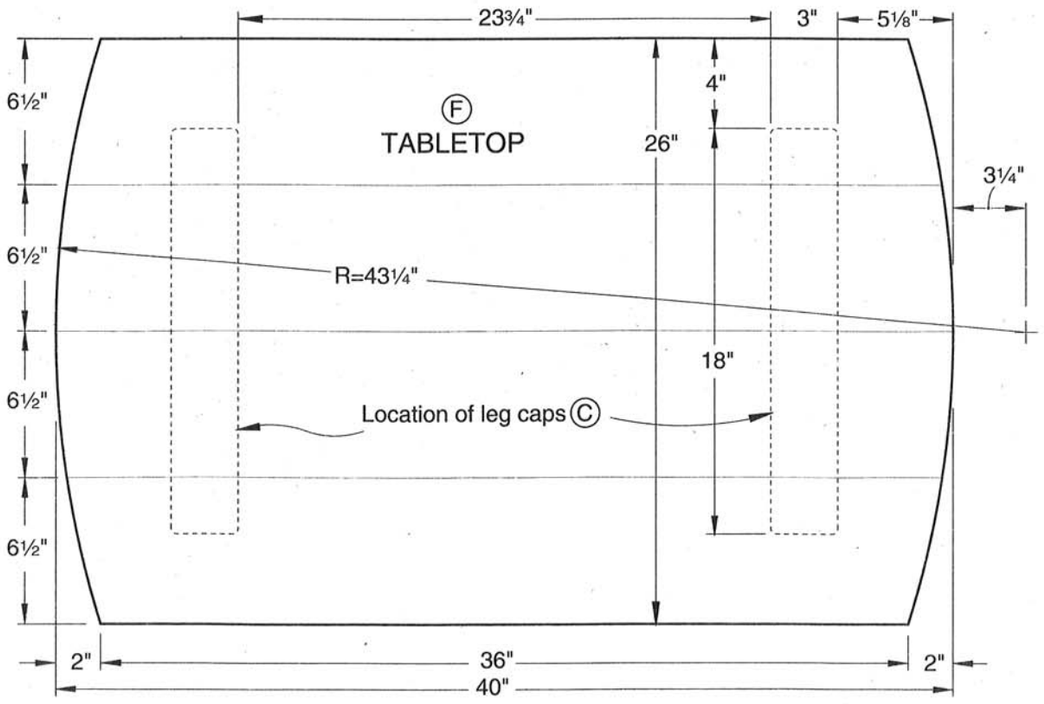


TRESTLE TABLE FULL-SIZE PATTERN AND PARTS VIEW
See page 76





PARTS VIEW



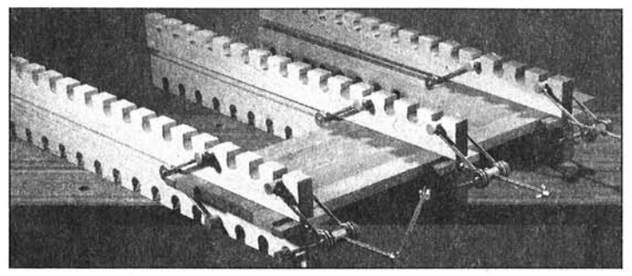
Better Homes and Gardens® WOOD PATTERNS

For your woodworking convenience

FEBRUARY 1999 ISSUE 112

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.

Panel Clamps
Morris Chair
Kitchen Utensils
Trestle Table
Stack-laminated Bowl



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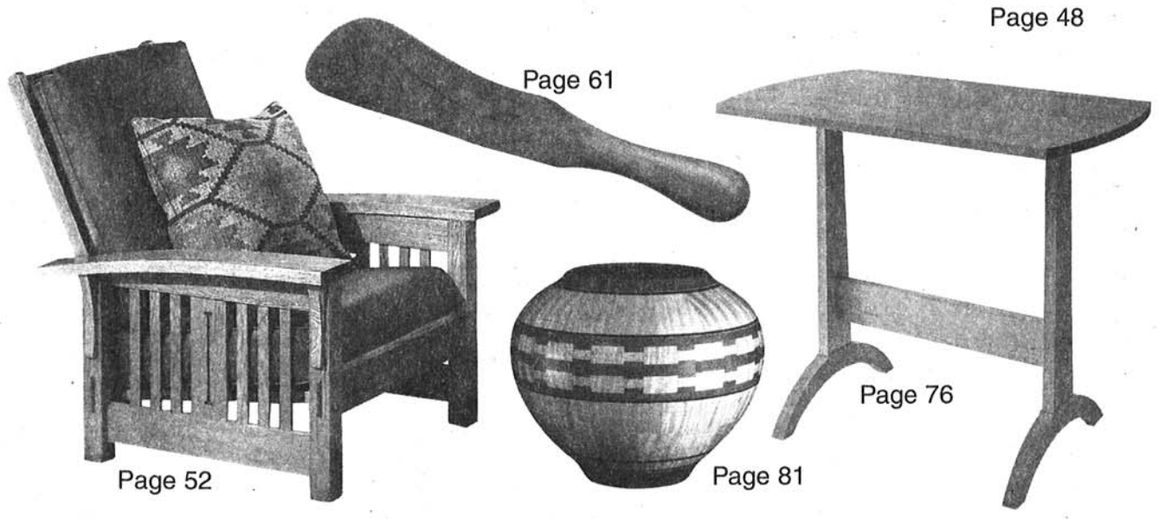

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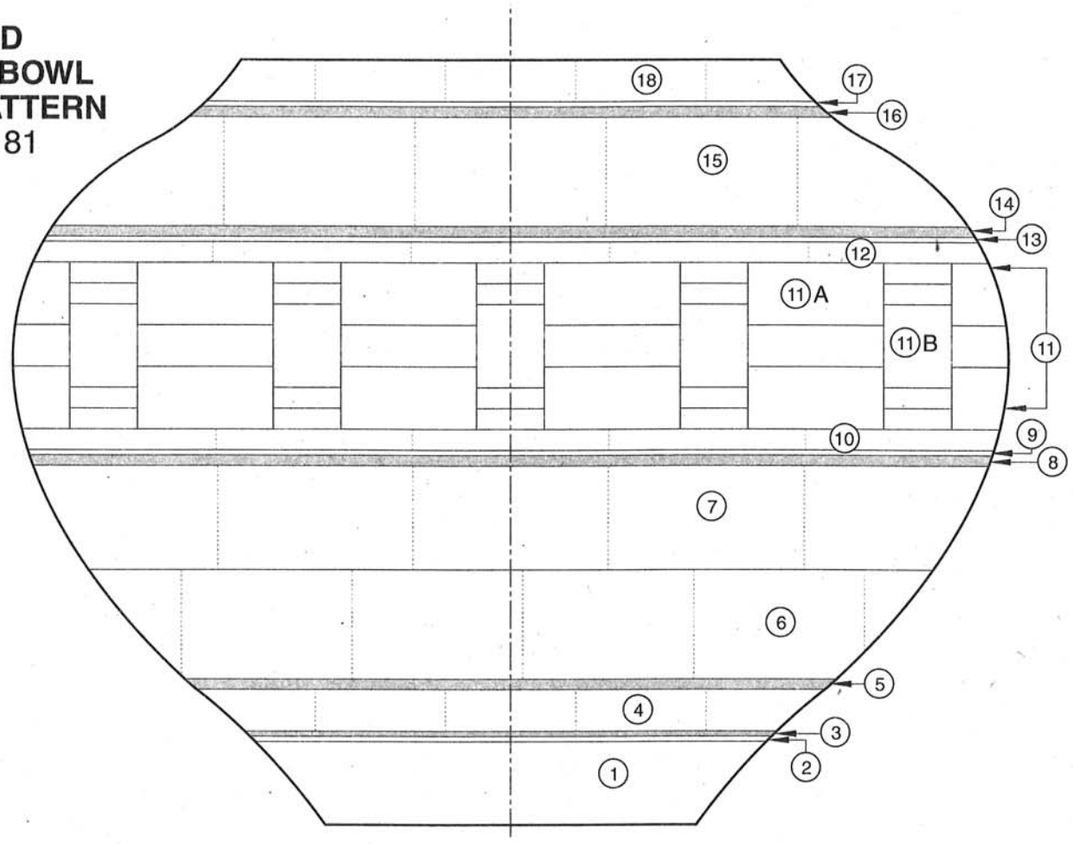
STACKED LAMINATED BOWL FULL-SIZE PATTERN
See page 81



KITCHEN UTENSILS
FULL-SIZE PATTERNS
See page 61

Note: Checking with upholsterers around the country, we learned that the supplies and the thicknesses of materials used very greatly. We recommend providing our drawings and your chair to your upholsterer, and having them make the cushions to fit your chair.

BACKREST FOAM
5" high-density foam

22"

26½"

1½"

78"

#4 steel zipper

22¾"

31¼"

BACKREST CUSHION PATTERN
2 pieces needed

27"

½" seam allowance

SEAT FOAM
6" high-density foam

24"

26"

Material for piping

1⅜"

Ⓙ
ARM
SUPPORT
(4 needed)

#4 steel zipper

1"

2½"

5"

1"

4"

9"

1"

2½"

5"

63½"

22¾"

25¾"

SEAT CUSHION PATTERN

½" seam allowance

65"

1½"

Material for piping (2 needed)

SEAT CUSHION END
2 pieces needed

6⅛"

½" seam allowance

R=2"

27½"

Ⓔ
CENTER
SIDE SLAT
(2 needed)

4¼"

2"

1"

13"

¼"

2"

2"

2"

¼"

PARTS VIEW

5½"

Ⓘ
ARMREST
(2 needed)

⅝" holes 2" deep

3½

TOP VIEW

1⅛"

Three ⅜"-thick strips laminated to 1⅛" thick

Ⓘ

⅝" holes 2" deep

SIDE VIEW

3"

5½"

TEMPLATE/FORM

5⁵⁄₁₆"

4¼"

1⅞"

12"

12"

36"

8¾"

MORRIS CHAIR
FULL-SIZE PATTERN
AND PARTS VIEW
See page 52